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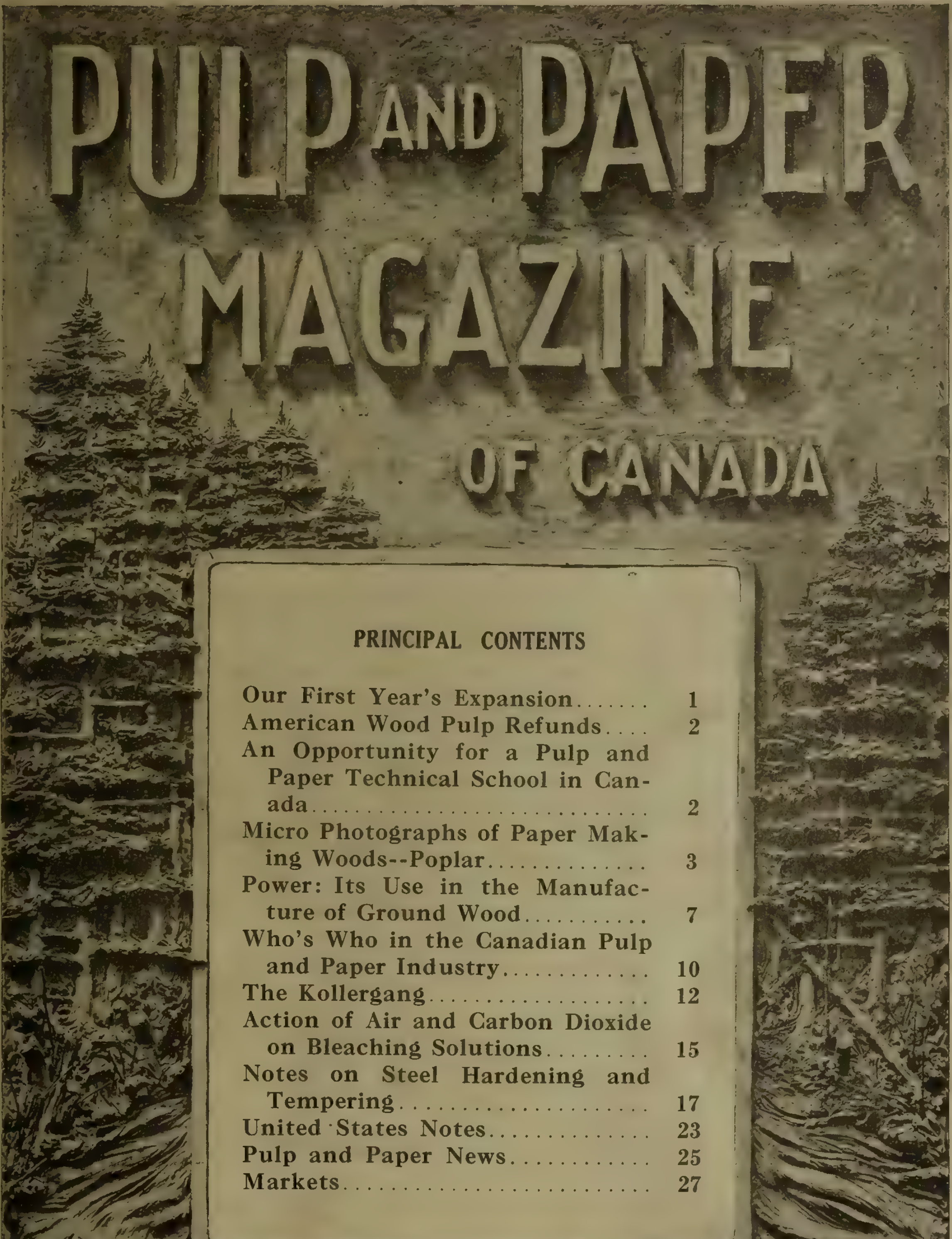
VOL. XII. MONTREAL, JANUARY 1, 1914 No. 1



PULP AND PAPER MAGAZINE OF CANADA

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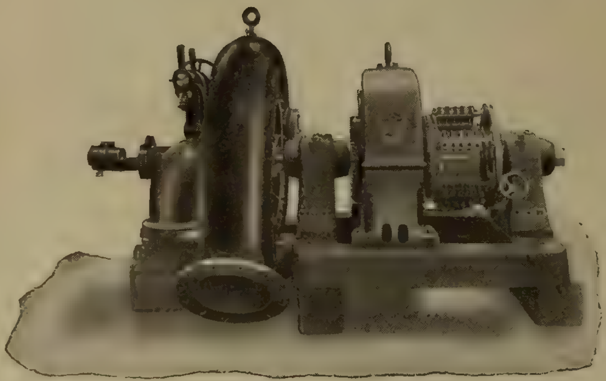
HYDRAULIC TURBINES

SPECIALLY DESIGNED TO SUIT
CONDITIONS OF OPERATION



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Direct connected to Electric Generator

110 H.P.
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Driven by Electric Motor

300 G.P.M.
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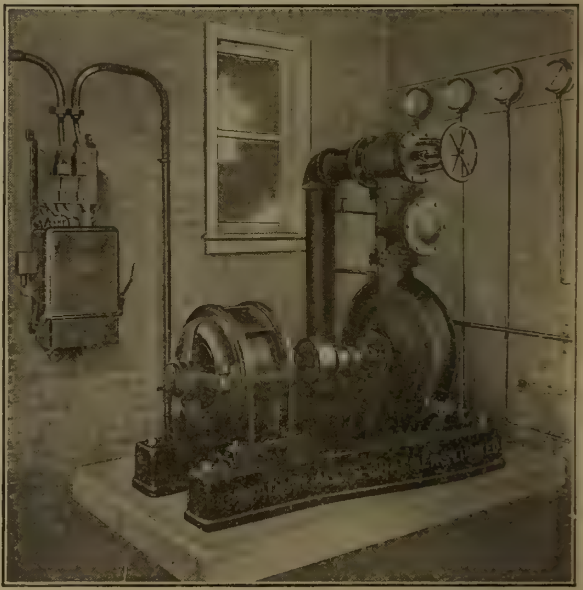
105 Ft.



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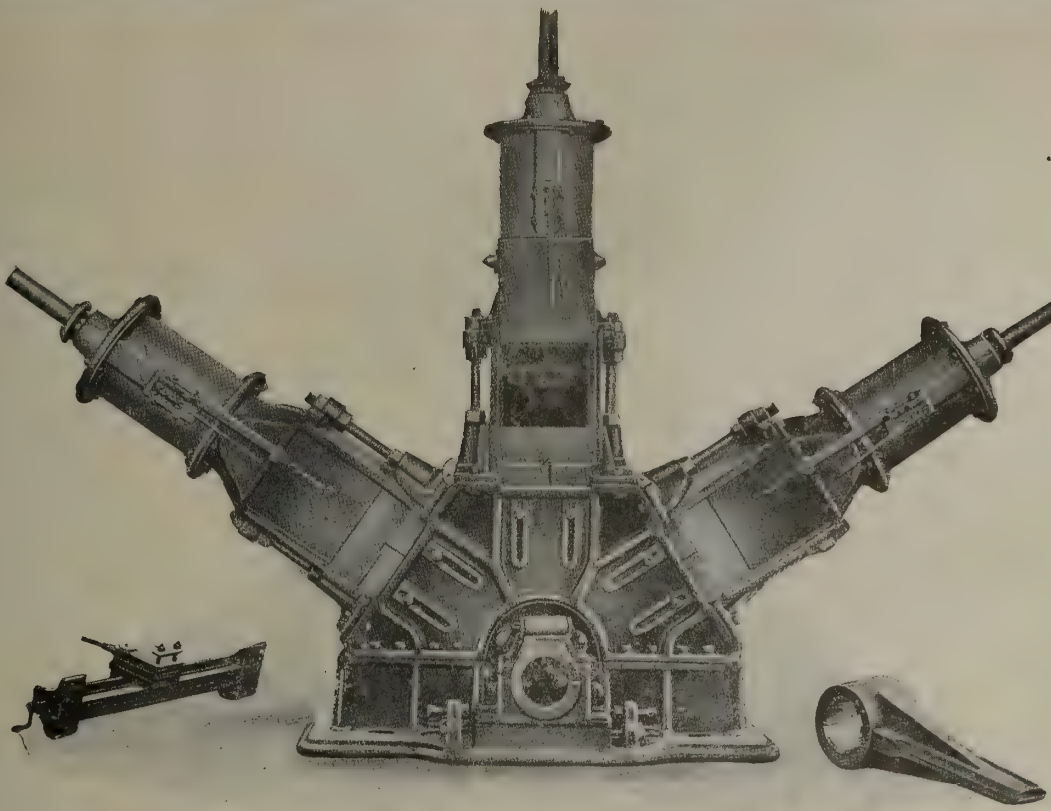
Head Office: TORONTO. District Sale Offices: Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert



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18 Tansley St. - - Montreal

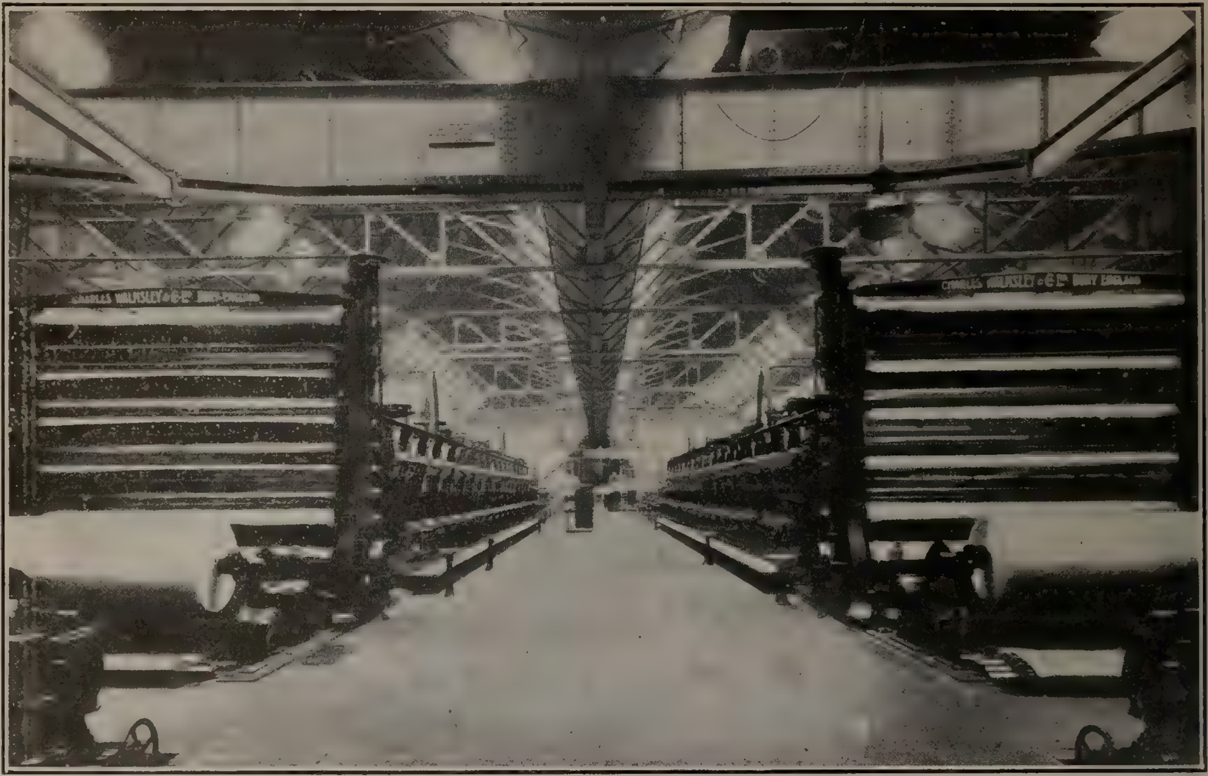
Manufacturers of

Grinders, Wet Machines, Screens and Sulphur Burners.

Full Specifications and Prices furnished on application.

Rotary Sulphur Burner

Interior of the MACHINE ROOM of MESSRS. EDWARD LLOYD, LTD., SITTINGBOURNE, ENGLAND, containing the last two machines supplied to this Company by Chas. Walmsley & Co., Ltd.


CHARLES WALMSLEY & Co. Ltd. BURY, ENGLAND
CHARLES WALMSLEY & Co. Ltd. BURY, ENGLAND

These "Walmsley" Fast News Machines are 175 inches wide, and are making paper at OVER 600 FEET PER MINUTE, with an OUTPUT OF 500 TONS NEWS PRINT WEEKLY. The machines are equipped with the Lloyd and Hutchison Patent Drive. This patent device is controlled by Walmsley & Co., Ltd., and dispenses entirely with Friction Clutches and Gear Wheels.

Charles Walmsley & Co. Ltd.

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ATLAS WORKS
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Codes, WESTERN UNION, A.B.C. 5TH EDITION, McNEILL'S 1908
Telegrams, "PUMPS, BURY." *Telephone,* BURY 499

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- **Complete Paper Mill Plants**
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- **Slitting and Re-Reeling Machines**
- **Beating and Refining Engines**
- **Super Calenders**
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CANADA:
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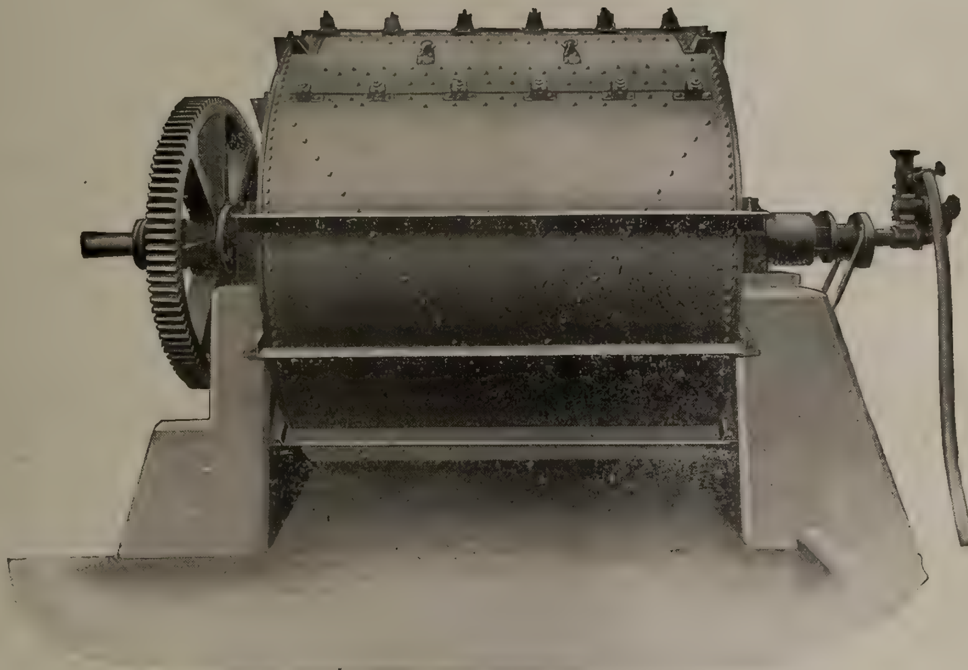
This Barking Drum affords the means of an immense saving in barking wood for pulp mill process



The BACH-WIIG Barking Drum

In this machine the bark is removed by the action of friction and water, therefore there is absolutely no loss of wood, shrinkage in cubic measurement being confined entirely to the percentage of bark. Tests made against the knife barker have shown the following results:

The Loss with the Barking Drum	
Round wood covered with bark	8%
Slabs	23.8%
Edgings	9.4%

Loss with Knife Barker	
Round wood covered with bark	22 to 24%
Slabs	50%

Loss with edgings on knife barker not given as it is well known they cannot be handled practically on knife barker, so really the savings on edgings is their comparative value for fire wood or for pulp wood

Any of our offices will be glad to furnish further information if requested

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LIMITED

General Offices, SHERBROOKE, QUE.
Factories, Sherbrooke, Que. - St. Catharines, Ont.

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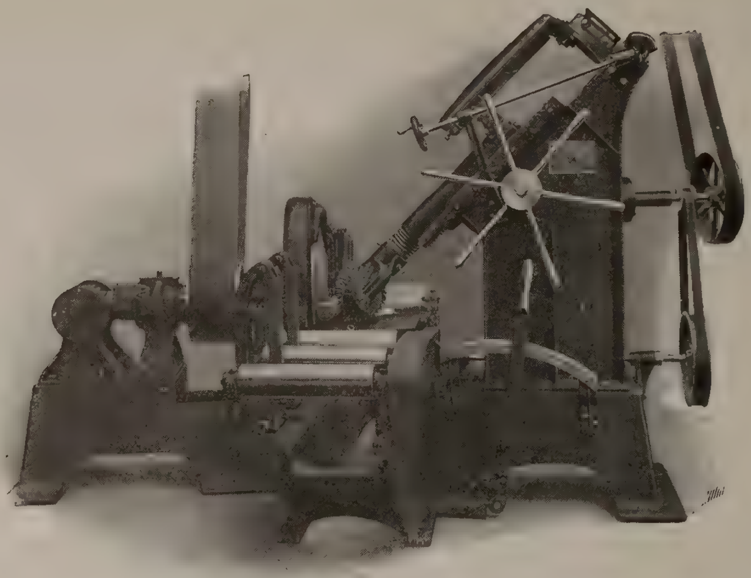

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All Widths

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Only the best

Wires held in
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Wires held in
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prompt delivery

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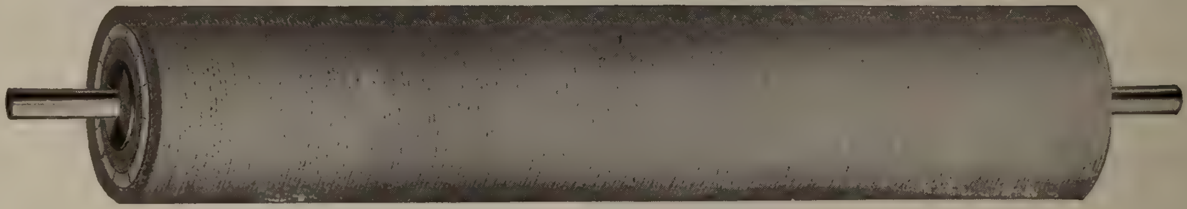

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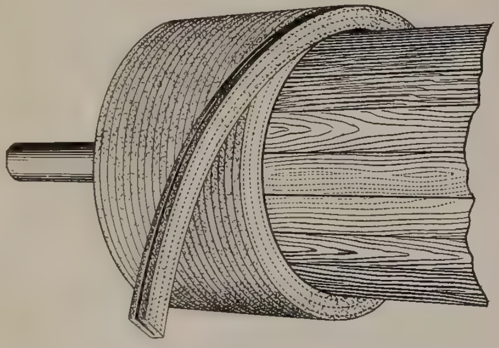
THEY KEEP ELASTIC
THEY ARE RIGHT IN PRINCIPLE AND MAKE GOOD IN PRACTICE



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Valuable improvement for cylinder machines.

Always in perfect condition.

Increases production of machine.

Paper of better quality produced.

Superior to rubber rolls.

Especially valuable on board machines.

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Suction Pumps
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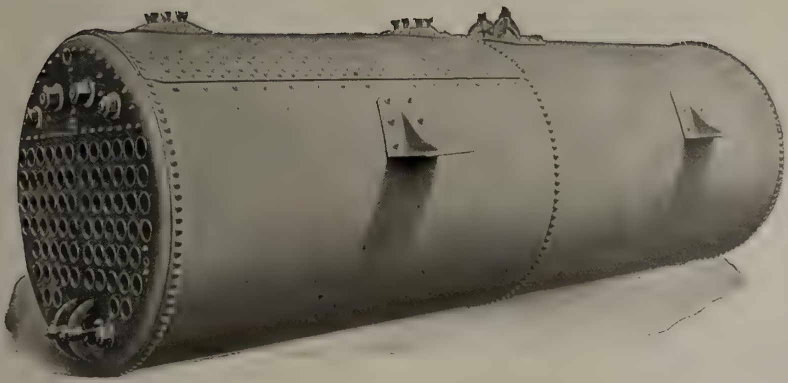

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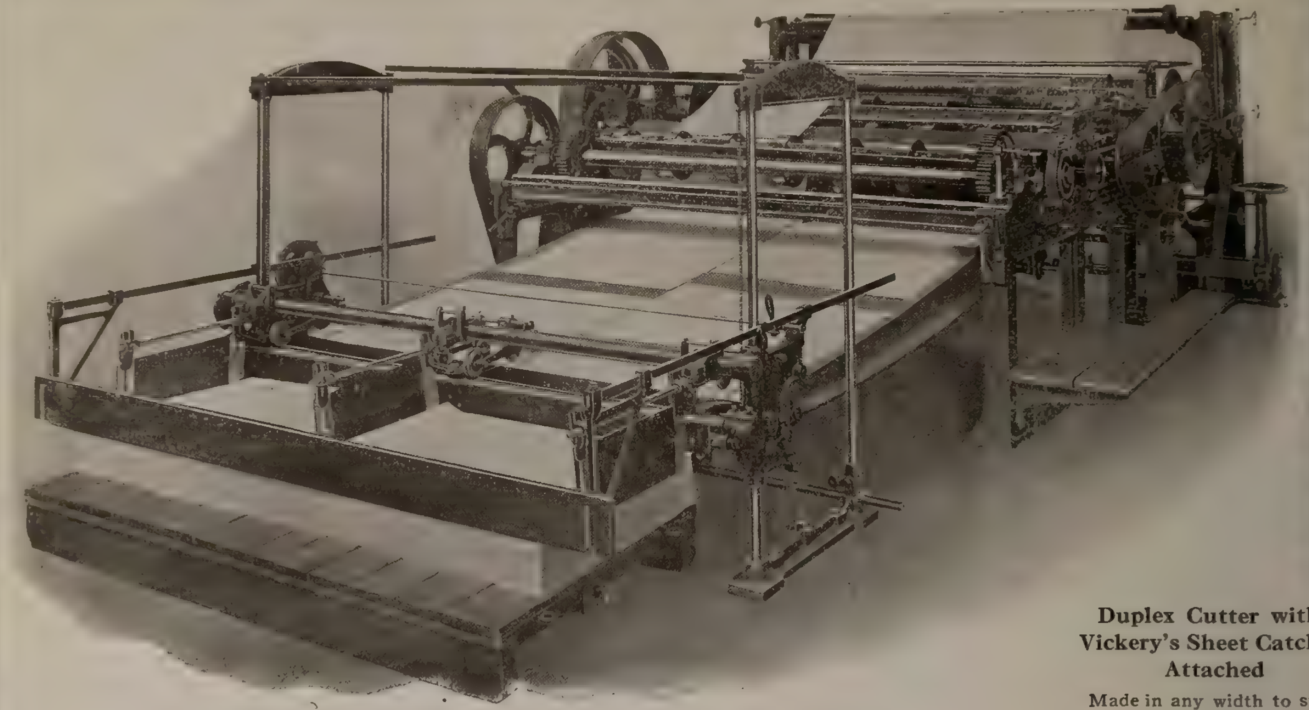

Duplex Cutter with Vickery's Sheet Catcher Attached

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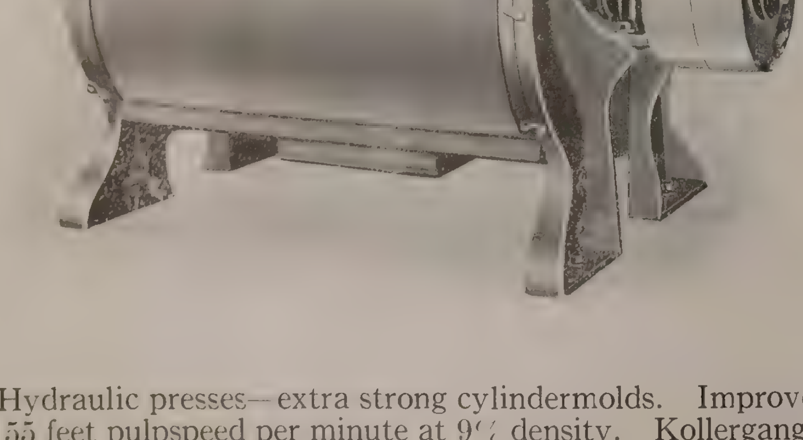

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Effective

Patented in Canada and many foreign countries

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3 "	Dryden Timber and Power Co.
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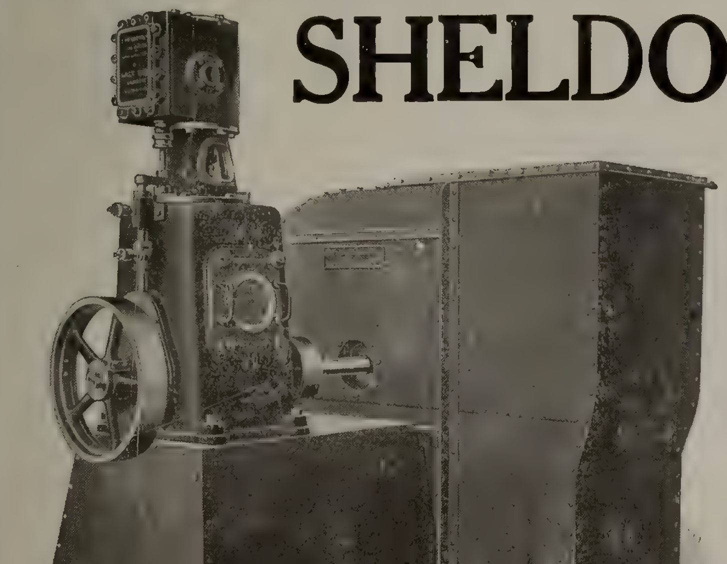

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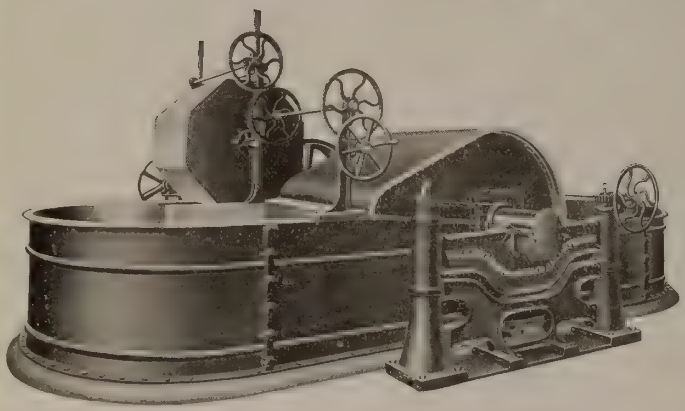

Beating, Washing and Bleaching Engines. Barkers—Barker Attachments — Chippers—Rechippers—Chip Screens (Revolving)—

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Perfection in Every Detail

Correspondence Invited.

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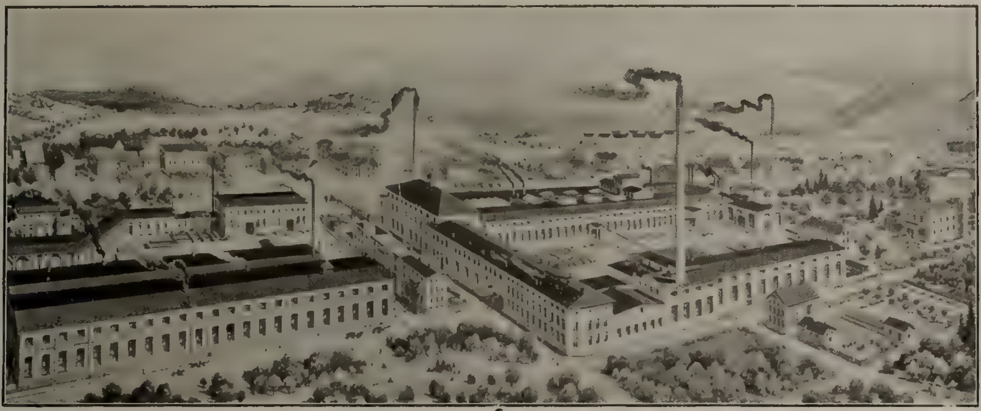

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Construction of all machines and complete installations for paper, cardboard, pasteboard, cellulose, and woodpulp plants

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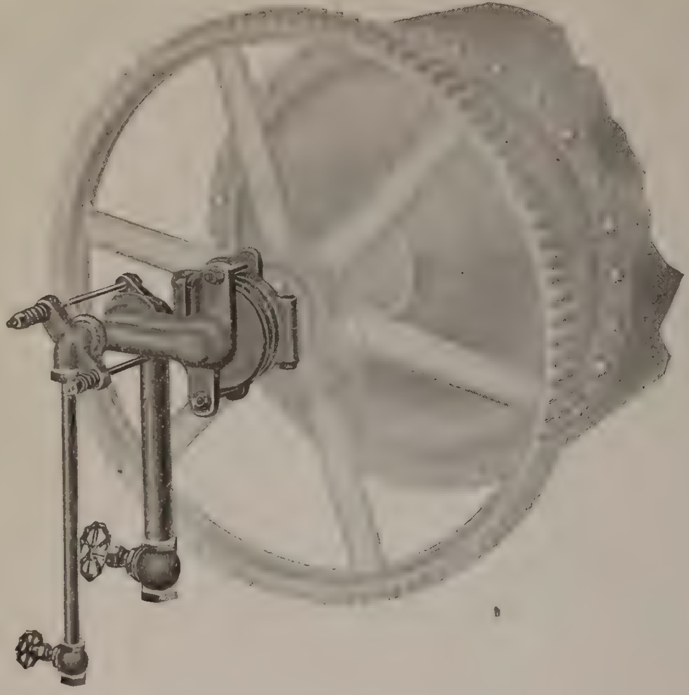

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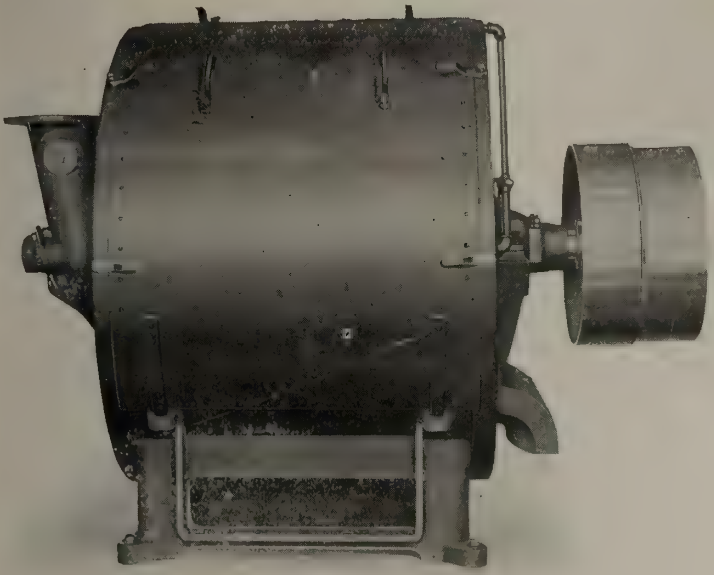

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Horizontal and Vertical Design.
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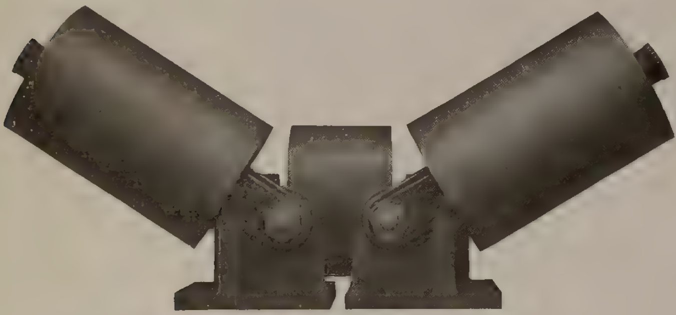

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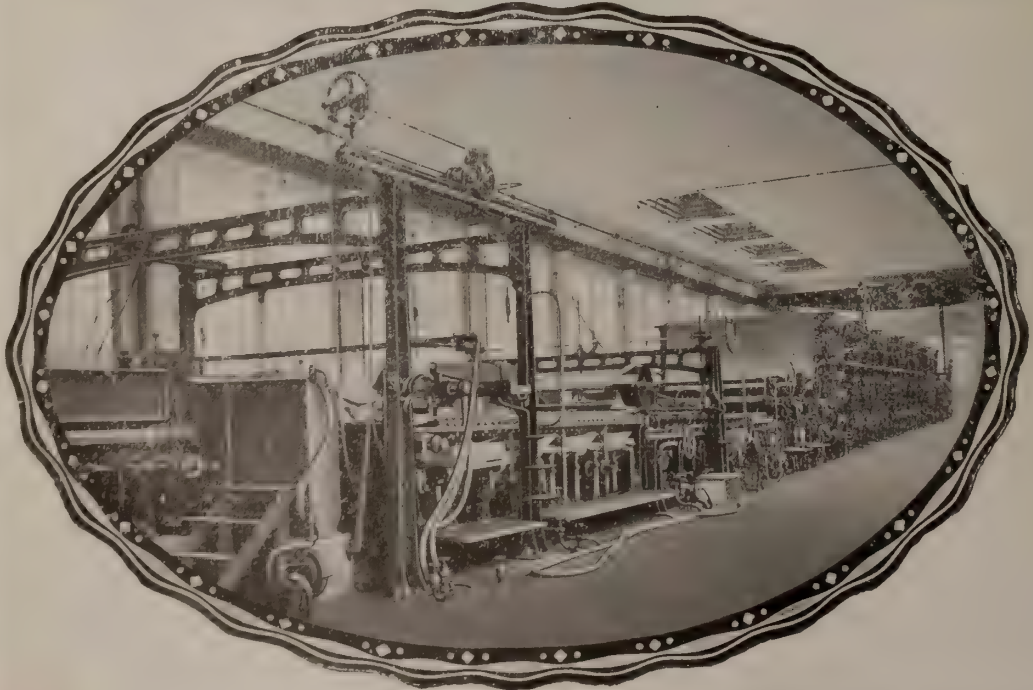

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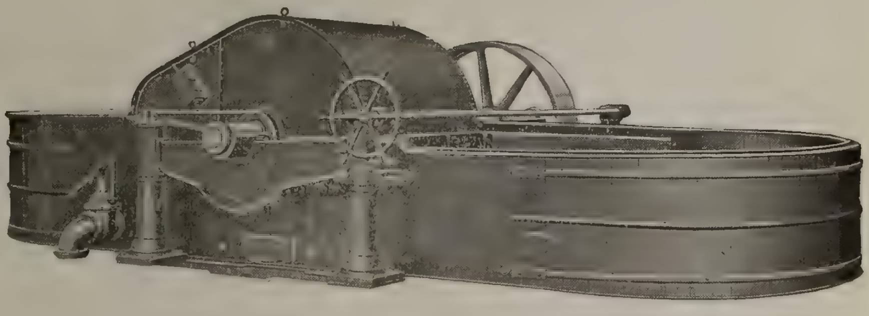

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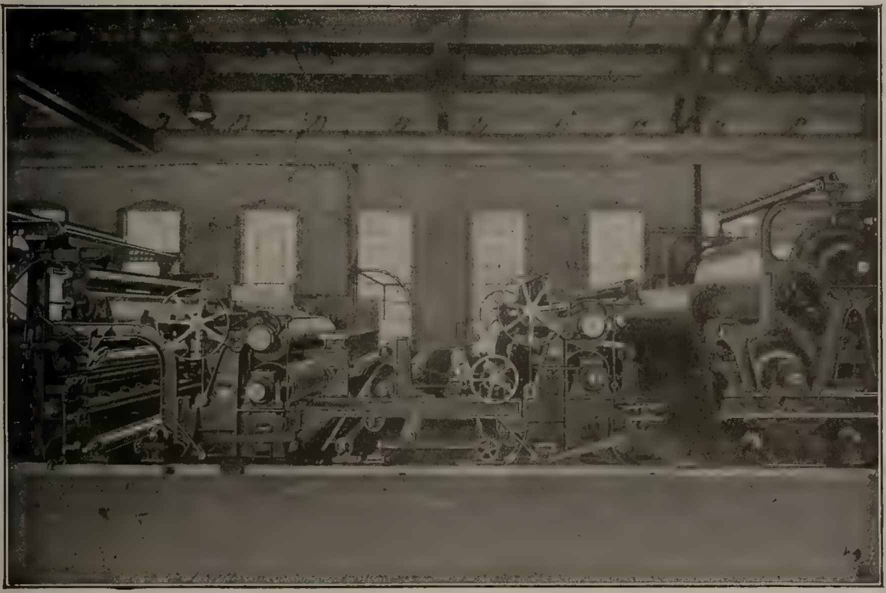
Patented Wooden Sectional Suction Box Covers. Warner's Patent Metal Sand Catcher for Beating and Washing Engines



Harper Fourdrinier Paper Machine

Send for our bulletins describing this machine

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DILLON MACHINE CO.
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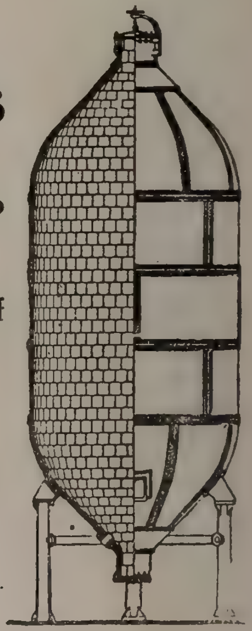

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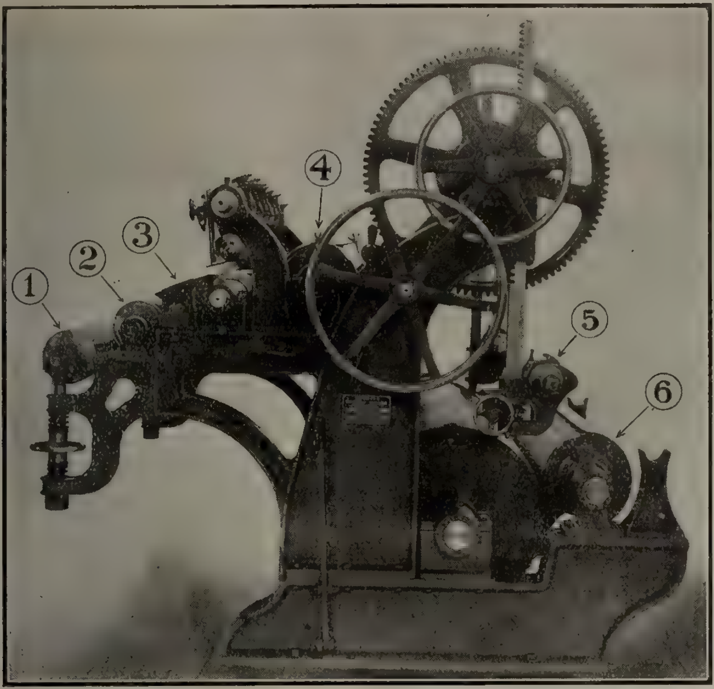

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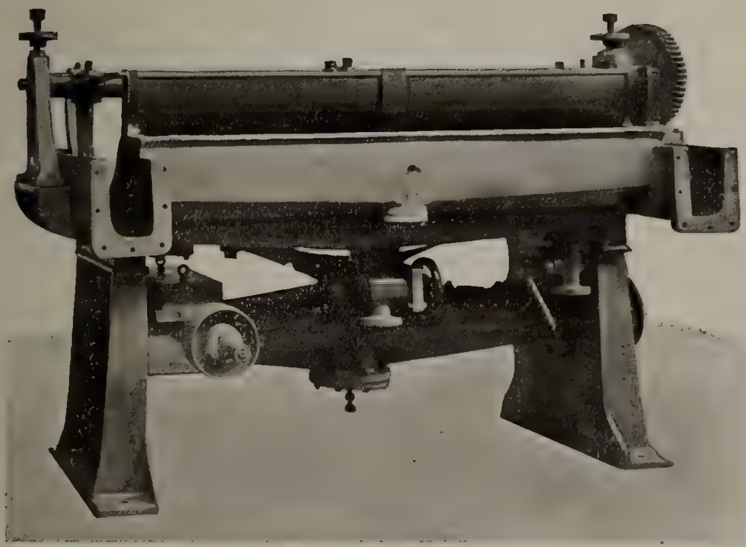

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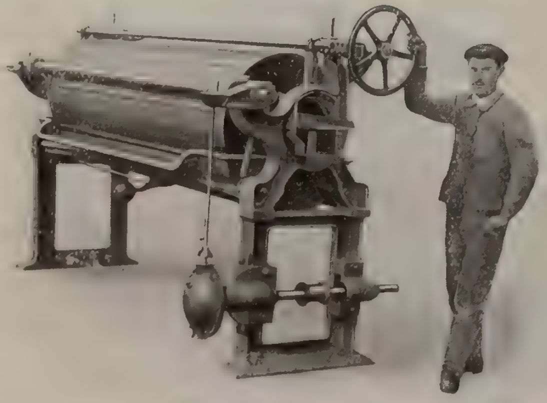

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OF CANADA

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Our First Year's Expansion

WITH this number, we open the twelfth volume of publication and our second in our present expanded and enlarged form. The Pulp and Paper Magazine, which was started eleven years ago as a very small journal, went through a slow period of growth during those first years when the pulp and paper industry was only one of Canada's smaller and struggling industries. Now that it is assuming the proportions of one of our largest and most prosperous industries, which uses more of our raw material every year than most others we have shared this growth and have attempted to keep pace with the rapid stride of the industry itself. If we are to believe the many messages which have reached us during this year while we were enlarging and developing, our efforts have met with the greatest success. We must here express our appreciation of the thoughtfulness of subscribers and advertisers in giving these words of encouragement which, in work of this kind, is of the greatest benefit. We know that we are giving to our subscribers for the small sum at which our annual subscription is placed, very much more than journals in other countries devoted to this industry are giving, or in proportion much more than similar magazines in other industries in our own country.

If our subscribers will look over the volume of the back numbers during the last year and realise what a vast amount of information which is really valuable and useful, they have secured, we venture to suggest that they will be surprized at the modest subscription price which is asked.

Looking over the past year, it has been of considerable satisfaction to note such a large number of remarkably good articles. We mention the following few as indications of the type of subjects which have been treated:

"Preservation of Paper."
"Calender Dyeing."
"Manufacture of Sulphite Pulp."
"China Clay."
"Hydrolysis of Cellulose and Ligno-Cellulose."
"United States Forest Products Laboratory."
"Manufacture of Straw Board."
"Testing of Paper."
"Pulp and Paper under the Microscope."
"Talc."
"Hydration in Papermaking Processes."
"Making of Kraft and Sulphite Pulp."
"Chemistry of Rosin Sizing."
"Efficiency Studies."
"Transmission of Power."
"Scientific Forestry."
"Grinding of Spruce for Mechanical Pulp."
"Conversion of Long Leaf Pine to Paper Pulp."
"Power Consumption when Beating Half or Whole Stuffs."
"Large or small Beating Engines."
"Micro Photographs of Papermaking Woods."

For the coming year, we propose to extend this expansion and enlarge our outlook in a very material manner.

For the past we thank all our friends and clients and for the future we promise the very best which the world of pulp and paper affords.

American Wood Pulp Refunds

THE decision of the American Congress to refund the Wood Pulp Importers of duties paid illegally since the Canadian Reciprocity Act came into effect on July 26th, 1911, has not been carried out as it was first reported it would be. It seems that the Treasury Department is attempting to hold back by hook or by crook, as much of this $3,000,000 as possible. Each individual case must be taken before court and go through the general round of expensive litigation. Commenting on this situation, Mr. Albert H. Washburn of Conistock and attorney for the American Wood Pulp Importers' Association says:

"When the Government issued its letter of acquiescence last summer (conformably to its usual practice), I think we all assumed, quite naturally, that the end of this litigation was assured. It developed subsequently that the refunds being made were limited to those protests actually in the possession of the various Collectors of Customs—in other words, protests which had not been forwarded to the Board of General Appraisers for action under the statute. As they go forward in a routine manner, it happened that the refunds affected only, generally speaking, the latest shipments. All the other protests were on the suspended files of the Board of General Appraisers awaiting the final outcome.

When my office sought to have these thousands of cases taken up for prompt decision we encountered opposition. Except by consent they could only be disposed of by regular calendar call on the Board docket and that consent was withheld. This meant delay until the autumn. By that time it was evident enough to me that a matter of policy was involved here, and what that policy was presently became plain enough in view of the disquieting rumors of special legislation to enable the Supreme Court to review the decision of the Court of Customs Appeals. That this is the programme is no longer concealed. Whether it will succeed or not remains to be seen. With the tremendous weight and influence of the Administration, as reflected by the Attorney-General and the Treasury Department, there is certainly ground for apprehension. If it does succeed the ultimate outcome will be prolonged for months, and perhaps years.

The number of protests is so large and the work of examining the affidavits and invoices in each case such that the clerical labor of disposition is enormous. Without going into detail, it is sufficient to say that it would take several months to bring this matter to the point where the collectors could reliquidate and refund even if the Government were to co-operate with us to secure reasonable expedition. In the absence of that co-operation, it is entirely possible (by the simple device of appealing at the end of the statutory time allowed) for the Government to delay action for a number of months. By then legislation either will or will not have been secured, and my best judgment is based on a number of conferences with various officials, that, if the legislation be not obtained within a reasonable time, the Government will quit and consent to expedition and final settlement.

"This is a plain statement of the present situation. Whether Congress will approve of the Government programme is not yet apparent. It amounts, of course, virtually to an effort to recall an acquiescence in and reverse, if possible, the decision of the Court of Customs Appeals. It may be that some of your customers, who are, I believe, largely interested under their contracts with the members of your association in these refunds may wish to take up this matter with the members of Congress and Senators from their respective States and enter a vigorous protest against this proposed legislation. Action has been deferred, I understand, until the opening of the regular session is most opportune. It seems unfair to ask that this legislation apply to issues decided in the case and thus make it virtually retroactive. If it is to be enacted at all, it should operate prospectively only, that is to say, to cases arising under the law of 1913."

The decisions of the Treasury Department of the United States have been most vacillating in this connection. Under the Favored Nations Treaty, they found they were obliged to give the same treatment to all countries as to Canada. Great objection has, however, come up to the way in which the matter has been handled by the Department. It has been difficult for the Wood Pulp Importers to know where they are at. Such conditions make trade most unsatisfactory and it seems that in the pulp and paper industry, the Treasury Department has a special faculty for making very peculiar decisions.

An Opportunity for a Pulp and Paper Technical School in Canada

THE recent reports since the opening of the University of Maine have advised us that they are establishing there a department of pulp and paper making similar to the school which is in operation at Darmstadt, Germany. This will fill a long felt need in the United States where, as Mr. Hastings, President of the American Paper and Pulp Makers Association, says: "What the paper manufacturers want is a better class of men to become interested in the manufacture of paper. . . . The Association now has on file the requests of many manufacturers for superintendents and managers of paper mills, and it is very difficult to secure men with necessary practical knowledge to take up the positions. The salaries are unusually good for the amount of ability required, but there do not seem to be enough men to go around."

The University of Maine is erecting a $75,000 building which will accommodate this course in pulp and paper. As is well-known to our readers, there is a very fine technical school in Manchester, England, which gives courses on pulp and paper manufacturing. The number of students there, however, taking this course is only about ten to fifteen, so we naturally see the case of a country like Great Britain, which is a large manufacturer of pulp and paper, only supplying a few students to such a school. It is quite certain that there is not an opportunity in this country for a separate school on pulp and paper technology, but as we have pointed out before, a combination of circumstances is making such an opportunity in Montreal where any who are looking for such chances, no matter how few, may find them. McGill University is giving more attention than probably any other university on the continent to pulp and paper work. Besides this, the Government is establishing in Montreal, on the McGill Grounds, the new New Forest Products Laboratories. These, coupled with the advantages of a technical school of Montreal, make a chance here for short or long courses for those interested in pulp and paper. By next year any young man who wants to spend a couple of months in this kind of work will be able to do so in Montreal. This is exactly what we need for we are suffering very much from a lack of technical help in this country.

Editorial Comments

It is reported that the Dominion Government will not fill the vacant positions of trade commissioners in the various foreign ports, but will avail themselves of Great Britain's offer to make use of British consular service. This, on the face of it, looks like a good proposition, but is really a retrograde step in our commercial expansion. The development of Canadian trade in foreign ports should be left to Canadians, who are far more competent to promote our interests than British Consuls, who, although they would unquestionably render honest service, have not the knowledge and experience to render efficient service for this country. We are taking our place in the world's markets and are just now at a critical stage where it would be the grossest kind of foolish economy to save a few salaries in trade commissioners. Besides this, Canadians should have the opportunity of seeing in a representative capacity, something of the rest of the world They would come back and be much greater factors in our commercial life. We sincerely hope that the Federal Government will not attempt this experiment fraught with mischief making possibilities.

* * * *

The article in this issue on "Power: Its use in the Manufacture of Ground Wood," by J. H. Thickens, Ch.E., is most timely and useful. Mr. Thickens is without doubt the best qualified man in the world to speak on matters relating to the manufacture of ground wood. He is not only a technical man, but a practical pulp and paper manufacturer as well. We commend this article to the serious consideration of all interested in Ground Wood Manufacture.

BOARD FOR PACKING JOINTS.

Whereas packing made of rubber, textile fabrics, asbestos, etc., is used for high-pressure pipes, for low-pressure pipes packing made of board specially manufactured for the purpose is being used more and more. A very good board of this kind is made from pure soda celluloise. For cheap kinds up to 40% old paper is added, as strong old paper as possible being used. As to rags, only the cheap kinds of linen, cotton or jute rags are used. These are boiled with a little caustic soda at 2 to 2½ atmos. pressure and are charged unbleached into the beater.

The pulp must be beaten fairly greasy in the beater and is sized therein, preferably with animal size. If rosin size is employed this must be such that when the board is subsequently dried in the air (flue drying) it is sufficiently sized. Packing board is generally colored like red or grey rubber, and for this purpose is dyed as fast as possible with aniline dyes. Loading materials should be as free as possible from sand because otherwise the stamping blades suffer very much. One must work in such manner on the cylinder machine that the board is composed of as thin layers as possible and that they adhere firmly one to another. After being removed from the size-roll the board is hydraulically pressed, the press being filled as high as possible. The boards pass from the hydraulic press into the drying flue. Very thick boards which can not be suspended are sent through the drying flue whilst lying horizontally on specially constructed trucks. The flue must be so arranged that the boards are moistened at the end by air, so that they are obtained as tough as leather.

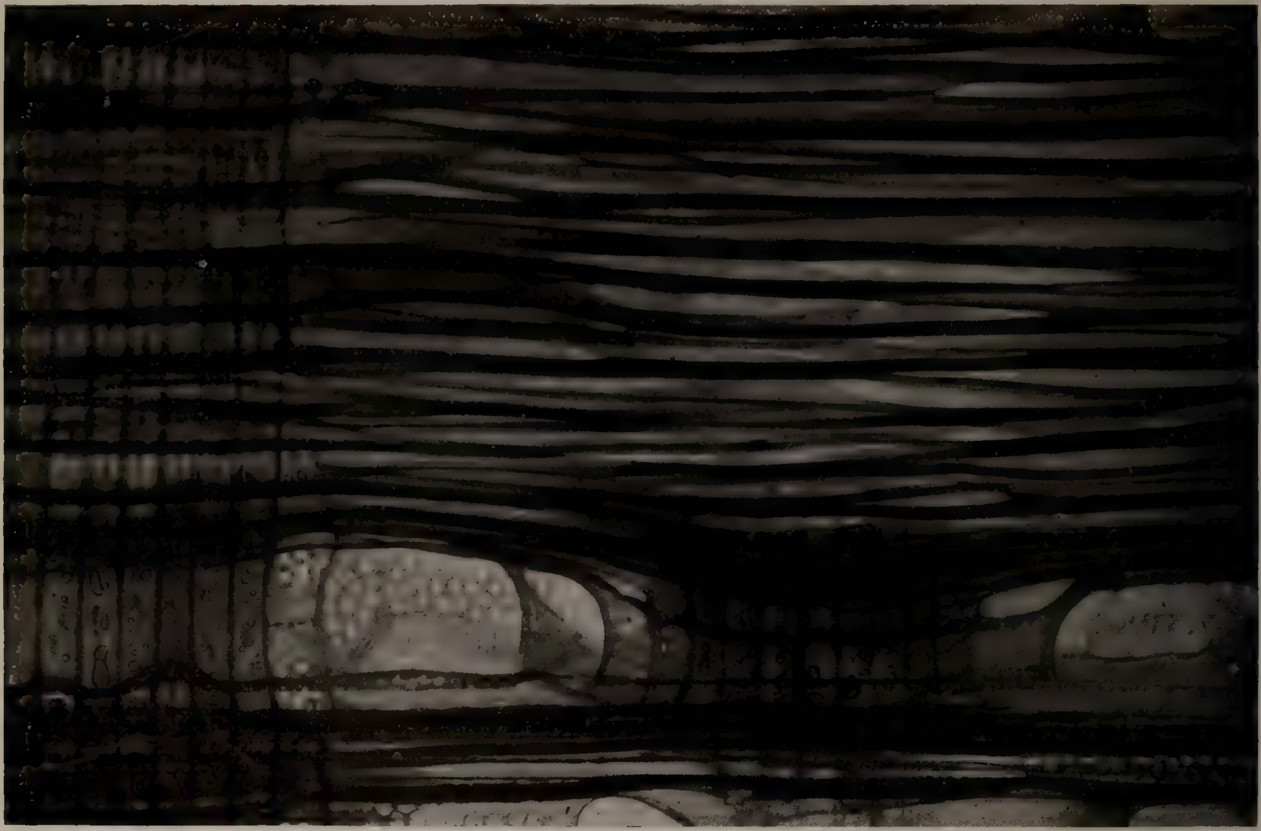
By admixing long cocoa-nut fibres packing board can be made which is very firm, even when otherwise only old paper is employed. The cocoa-nut fibres are added to the beater shortly before it is emptied. Generally it is necessary to wash the cocoa-nut fibres beforehand in the washing-engine. The pulp is not sent through the strainer because the cocoa-nut fibres would be retained. In the hydraulic press, press-cloths must be laid between the individual boards because the cocoa-nut fibres otherwise press into the next board.

These boards are not calendered; they are only repeatedly turned over and protected from becoming wavy by loading them severely.

Micro. Photographs of Paper Making Woods---POPLAR

By H. D. TÍEMANS, U.S. Forest Products Laboratory, Madison, Wis.

(Continued from last issue)



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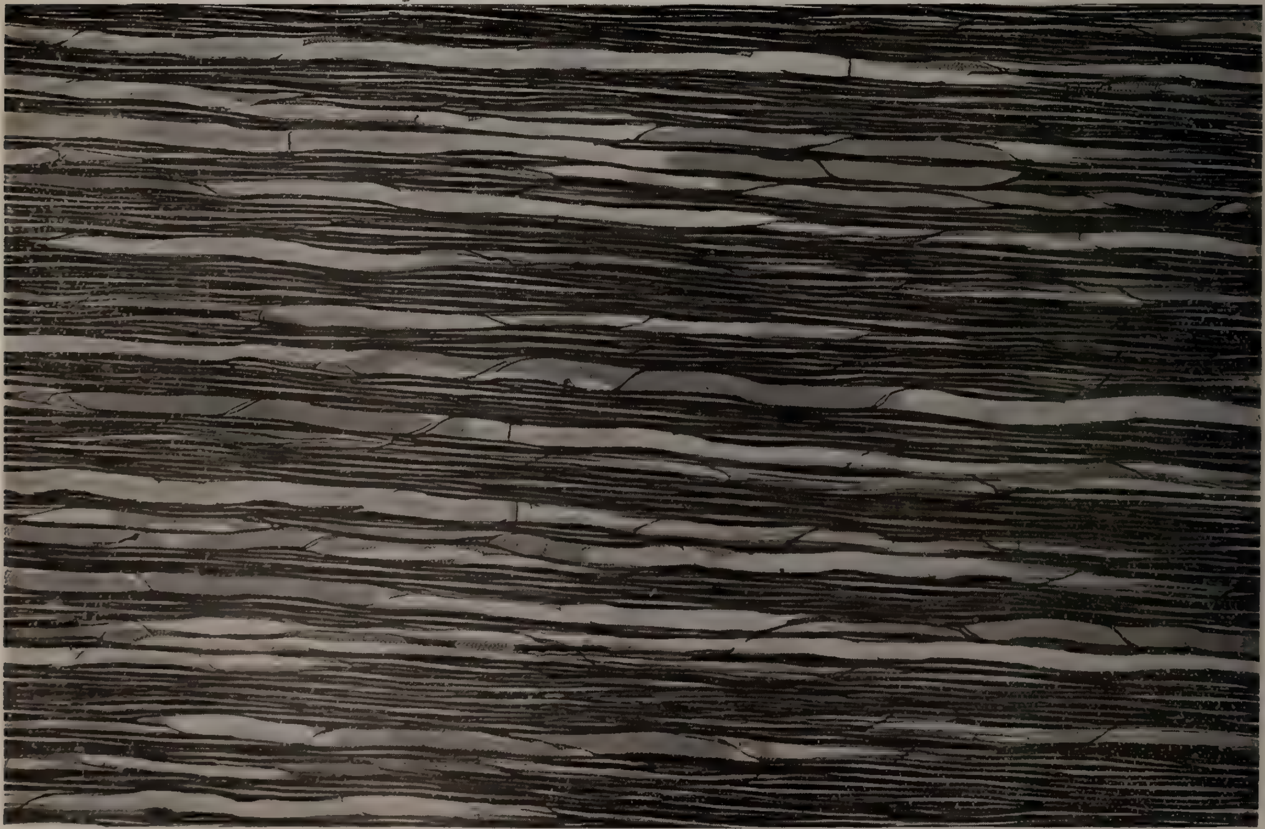

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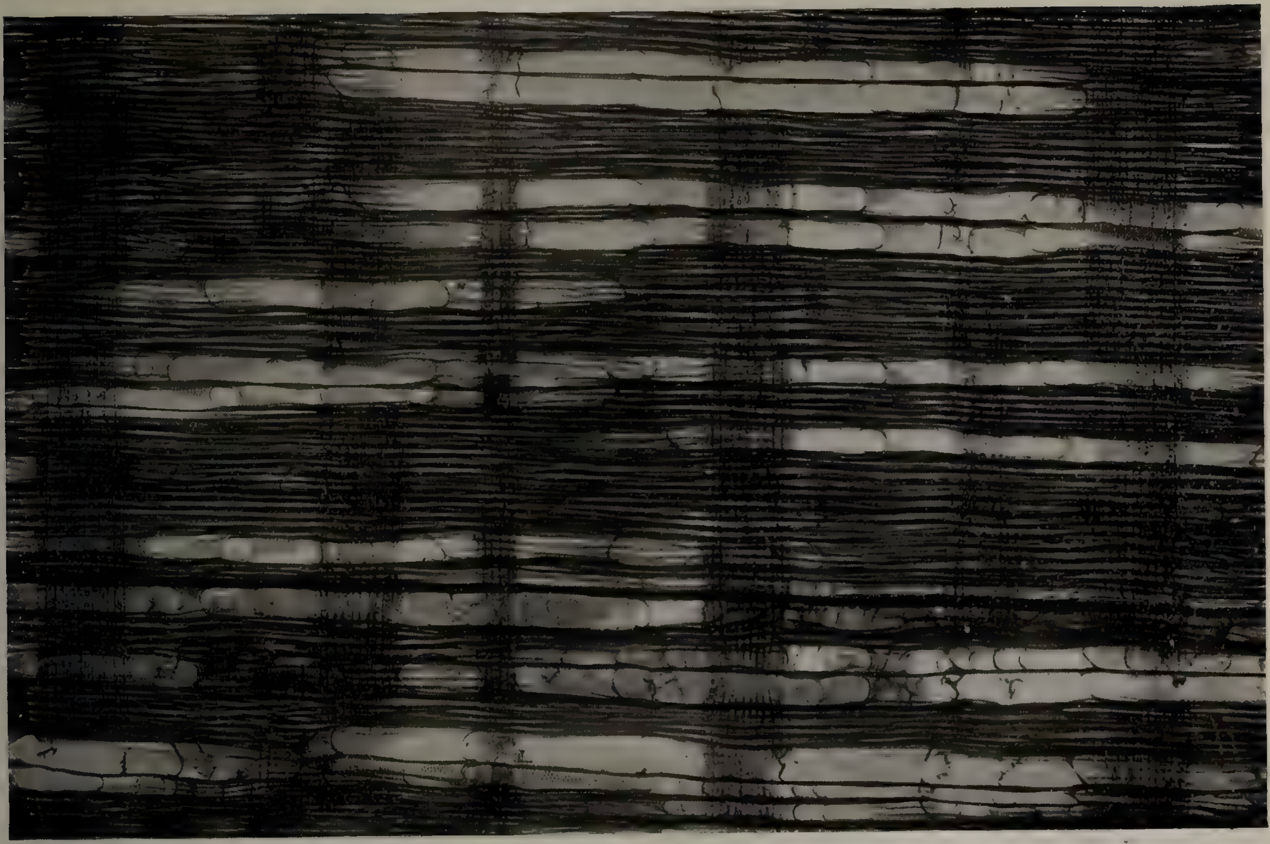

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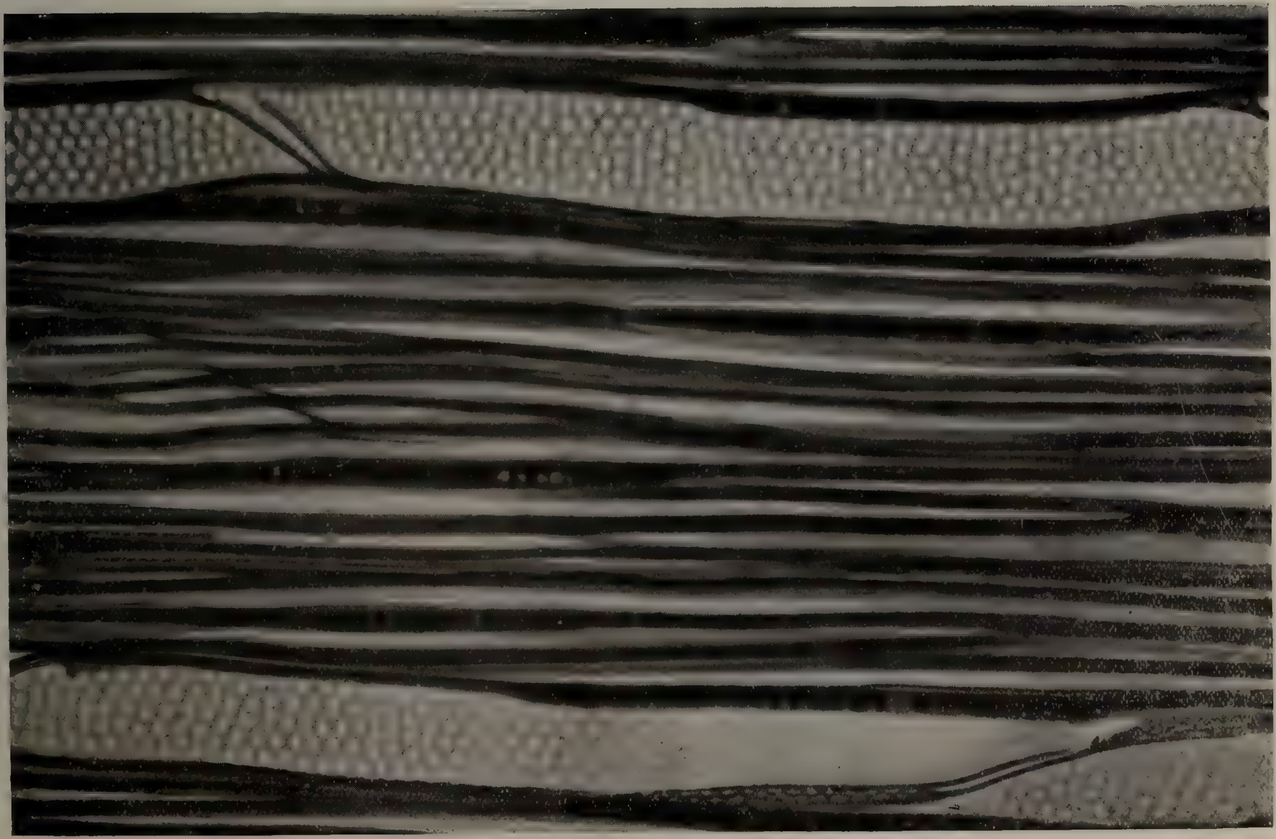

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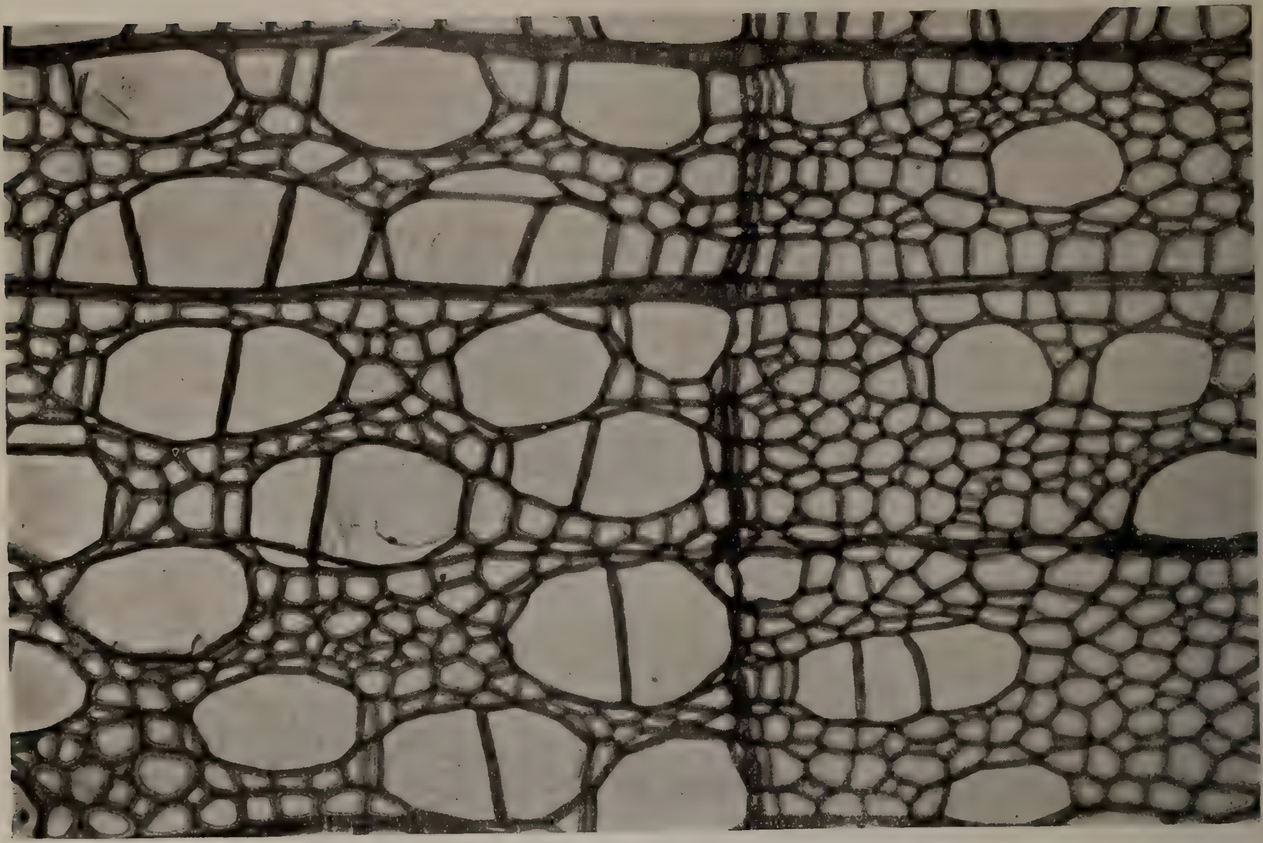

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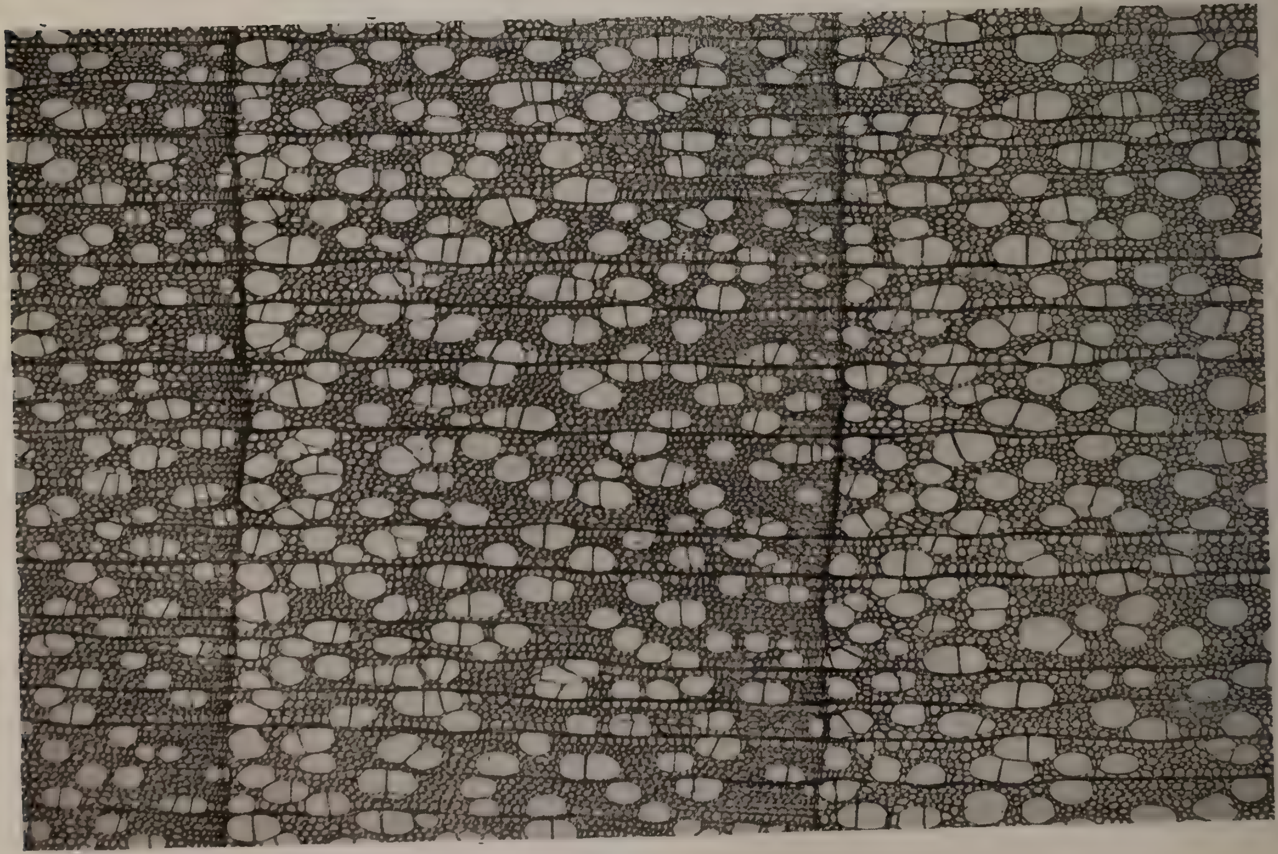

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POWER

Its Use in the Manufacture of Ground Wood

By J. H. THICKENS, Ch. E.

THE disintegration of wood to produce mechanical pulp is one of those processes which rely almost entirely upon the employment of main force for their accomplishment. Numerous attempts have been made to bring about the same result with the use of less power but so far these efforts have not entirely been successful. Wood is still held by pressure against a revolving pulp stone to produce practically fifty per cent. of the wood fibre used by pulp, paper and board manufacturers; a total of two million cords of wood are reduced to pulp in this manner each year.

When the amount of power which is required to carry out this disintegration is considered, the question of its more efficient utilization is immediately seen to be of prime importance. In the United States approximately 500,000 horsepower are used continuously in grinding of wood for mechanical pulp and it is quite evident that the possible adoption of more efficient methods would only result in a considerable saving of power and money each year.

In the past the designing of ground wood mills has been largely influenced by the manufacturers in the immediate vicinity of the mills under construction. Certain rules of thumb and unsupported theories have in many cases taken the place of correct scientific knowledge of the effect of the utilization of power under different conditions in the grinding operation. This is clearly shown when the methods of production of pulp in the different mills are considered.

There are in the United States approximately fifteen hundred wood pulp grinders of different size under operation and each one of these utilizes on the average approximately 350 horsepower continuously. Many of the grinders, however, are driven by as little as 135 horsepower and in other instances as much as 800 horsepower is available on pulp stones of like size. The great variation in the amount of power consumed is more striking when it is considered that the pulp is used most frequently in the production of the same kinds of paper, news print paper for the most part. It is evident that the consumption of such widely differing amounts of power on the stone must be accompanied by correspondingly great differences in the pressure, speed and surface of stone used in the manufacture of pulp. When so many different operating conditions are employed, it is likely that a large number are inefficient and a measure which could be taken to bring about a standardization of practice would necessarily result in more economical production.

As the result of experiments carried on by the United States Forest Service at Wausau, Wisconsin, it was found that there are a number of definite relations which exist between the speed of the pulp stone, pressure employed, surface of the stone, quality and rate of production of pulp and the power consumed in its manufacture. All these factors must consequently be considered in the selection of the grinding conditions.

Briefly, the results secured indicate that:

1. The rate of production varies directly with the pressure speed and the degree of sharpness of the stone.
2. The horsepower consumption per ton increases as the pressure decreases according to a fairly definite mathematical law. It is lower on sharp stones than on dull ones and increases as the speed decreases in much the same manner as it does with the pressure.
3. The yield of pulp per cord of wood increases with the pressure but it is not greatly influenced by the surface of the stone. The yield is slightly higher with high speed operation than with low.
4. The quality varies greatly with the surface of the stone and also with the pressure but is not largely influenced by the peripheral speed. A better quality is secured at high pressure and low speed than at high speed and low pressure.

Further consideration of these relations gives rise to interesting situations which show the possibilities of saving power and utilizing it more efficiently.

Considering the grinding pressure, it has been noted that the yield can be increased as much as 11% and the production increased 40% to 50% without making any other changes than the elimination of pockets on some of the grinders or of an entire grinder when there are a number of them on a single shaft. Take for example two three-pocket grinders with stone 54 inches in diameter by 27 inches face on a single shaft operating at 225 R.P.M. with one pocket as a surplus and having applied on each of the grinders 275 horsepower. With a fairly dull surface on the pulp stone it would be necessary to use a pressure of 40 pounds per square inch on two 14-inch cylinders of each of the grinders to consume this power and above three tons of pulp would be produced from each one or a total of six tons. If one of the grinders were eliminated and all of the power, 550 horsepower, were applied to a single stone and utilized in two pockets at the peripheral speed, a pressure of 100 pounds per square inch would be required on each of the two 14-inch cylinders to consume the power and the production of pulp would be increased to ten tons in 24 hours, an increase of four tons in the same period of time over that obtained from the two stones; in other words, doubling the power to a single grinder would treble its output in 24 hours.

In the example cited the power consumption per ton, if two grinders were used, would be approximately 92 horsepower while if only one were employed, it would be 55 horsepower. This reduction in power consumption per ton would be of course accompanied by the reduction in the quality of the product but not a corresponding reduction.

If the total of 550 horsepower were applied to a single pulp stone just as was done when a result of power consumption of 55 horspower was secured and the stone were run considerably duller, the total consumption per ton could be brought up in the neighborhood of 80 to 90 horsepower and the pulp could be obtained which would be considerably better than that produced with the like power consumption on two grinders. This would be brought about due to the fact that the quality of the pulp produced is much more greatly influenced by the differences in the surfaces of the stone than by the pressure employed.

Stronger pulp can be produced per horsepower at low values of power consumption than at high. Newspaper made experimentally for example, of a combination of 20% sulphite and 80% ground wood has a breaking length of 55 meters per horsepower per ton used in making the pulp if the latter is 55 horsepower per ton. The breaking length decreases to 45 meters per horsepower per ton if the paper is made of 20% of sulphite and 80% of ground wood produced at a power consumption of 92 horsepower per ton.

Here one immediately notes that the cost of the sulphite necessary to make up the difference in the strength is a factor equally as important as the power. In the example given above, the news print paper containing pulp produced at 55 horsepower per ton tested by Mullen tester had a strength factor of 0.300 points per pound, while that which contained pulp made at 92 horsepower per ton had a strength factor of .460. The tests given are high because of the fact that the papers were made at slow speed and were better formed and dried more slowly than could be done commercially.

In commercial practice the relative test would be more nearly .23 or .35 points per pound respectively for the pulps made with low and high power consumption. This difference in strength would have to be made up by the addition of sulphite to the weaker pulp and it would be necessary to determine in order to see that this is economical, that the saving on approximately 888 horespower hours and the resultant gain in production would counterbalance the greater amount of sulphite needed. When the grinding pressure is raised a considerable saving is made by vitrue of the fact that the yield per cord of wood is increased and this must also be held in mind in determining the most efficient power consumption per ton to use.

With a definite amount of power applied to the grinder, increasing the grinding pressure would have to be accompanied by reduction in speed or the use of a lesser number of pockets on the grinder. The efficiency of the turbine in case of waterwheel drive depends on being fixed at a certain speed likewise with motor drives the speed is fixed. So, if the pressure is to be increased, it is best to use fewer pockets on the grinders and the use of a smaller number of pockets is accompanied by another saving and results in increased efficiency. When all of the cells on a three cell grinder are used, due to the binding of the wood in the cells and the need of filling them, the total power available is only utilized about 88% to 90% of the time; in other words, 88% to 90% of the power is used continuously. If the pressure is raised on all three of the grinder cylinders and only two pockets are used in the operation, the third one being employed as a reservoir to be put on before another is thrown off, the total power will be utilized from 93% to 95% of the time. This means a great saving of power applied to a large number grinders, and it can be made still greater by employing a four-pocket grinder and using three pockets in the manufacture of the pulp.

The amount of power applied to grinders has been increasing from year to year. Installations made as early as 1880 are still in operation with approximately 125 horsepower to a stone, but the later designed mills seldom contain grinders to which less than 500 horsepower is applied. At the present time installations are being made where the grinders will operate under loads of from 600 to 800 horsepower and there are some employing grinders of different design where 1,200 horsepower are utilized on a single stone. Using accurate data, upon one-half of the grinders in the United States as the basis of an estimate, 36% of the total number of grinders employed are driven by turbines and motors of less than 300 horsepower capacity, and 8% of the grinders are driven with less than 200 horsepower. A more economical operation from the labor standpoint, greater yield, lower power consumption, higher rate of product, lower pulp stone cost would be obtained by more than one third of the producers of mechanical pulp if they would alter their equipment so as to use their power on approximately one-half of the number of stones. The production of as large an amount as possible from a single unit has been and always will be the motto followed by the progressive manufacturer. Generally, this is on the basis of the labor saving. In the case of woodgrinding, however, there is an added inducement on account of the more efficient production of pulp by the grinders as a consequence of the characteristics of the grinding process and the power saving which is effected results in greater production and that means an added measure of profit.

As long as spruce is available for the production of ground wood, it will not be necessary to use great care in the selection of the grinding conditions if the influence of these factors only on the quality of the product is considered. However, a fairly dull stone, high pressure and high speed or in other words, a large amount of power to a grinder will assure the manufacturer of product which will meet practically all requirements, and at the same time assure a more economical base of operation.

There are many conditions which require a very careful grinding of the raw material. One of these is encountered when the product is to be used in the production of a paper where chemical pulp is of relatively greater value than the power employed in the manufacture of ground wood. It is the general practice of news print manufacturers to use from 20% to 30% sulphite in their product. This amount can be very easily reduced to from 10% to 15%, and a paper of equal strength made if more power is used in the grinding of the wood. It is possible to produce news print paper of required strength and much better finish and appearance and not use any sulphite in its manufacture, but this is a condition which necessitates more than the usual care in the production of the ground wood pulp.

It is the contention of one group of papermakers that especially news print is made on the pulp stone while another group is of the opinion that the place to make it is in the beaters. It seems more logical to make the pulp on the grinders than it does in the beaters, particularly under the present method of operations. With the advent of stone roll beaters and the use of beaters designed to give greater efficiency, it is not unlikely that at some time in the future, pulp will be ground coarsely on the stones with the consumption of a small amount of power per ton and this material will be brushed under stone roll beaters with the resultant use of less power than is used at the present time, but before such a condition can exist, it would be necessary to prevent the formation of so much fine material in the grinding process. After the fibre has been cut into small portions, it is no longer possible to draw it out materially.

In each mill where mechanical pulp is produced, the subject of efficient utilization of grinding power is one which requires undivided attention to conditions governing the production of the pulp and its utilization is never the same in any two cases. It may be more economical to produce pulp at 50 horsepower and get double the production or use 100 horsepower per ton and greatly reduce the quantity of strength-giving fibre necessary to make a sheet of the required physical properties. Many producers would be inclined to change their operating conditions if they would give this matter careful thought. How frequently is it the case that power is being used by producers of mechanical pulp which could be sold as electrical energy at from $20 to $30 per horsepower year and they are not making a charge for it in the calculation of the cost of production? When 75 horsepower are used in making a ton of pulp in twenty-four hours, the charge for power at $25 per horsepower year would be approximately $6.25. What manufacturer could stand a charge like this?

The Manufacture of a Product Resembling Vulcanized Fibre

As raw materials cotton and linen are exclusively employed. The rags are very carefully sorted and before pulping are well boiled with soda. Beating is then carried out in the beating engine until no remnant of the fabric is longer present; the fibres must in this case remain unshortened. The pulp is caused to run direct from the beater into a centrifugal machine, the drum of which is lined with metallic cloth; the soda solution is thus flung out and the fragments of the fibres which are liable to cause trouble later on in the process are removed these fragments after separation being collected. The washed pulp is thereupon mixed with a quantity of zinc chloride and is converted by hand or on machines into a loose or spongy pulp sheet.

The chemical treatment of the pulp sheet so obtained has for its object to swell the various fibres and to convert them into a colloidal condition. According to the desired quality, the fibre may be converted into this condition only at the surface of the sheet. Of various solvents the greatest advantages are derived from zinc chloride because it is inodorous and 90% can be recovered. On the sheet which is then placed in a stoneware pan, is thereupon poured a zinc chloride solution of about 60° Be and the pan is then covered with a glass plate. After some hours the excess lye is drained off and the sheet which appears viscous on its surface is uniformly strewn with a layer several millimeters thick of finely sifted zinc chloride. When the powder has dissolved, the process can be accelerated by slight but very uniform heating. Regulation of the heat is best obtained in an electrically heated muffle furnace. The front wall of the furnace consists of a thick glass plate and the progress of the process can be followed by the aid of an incandescent lamp mounted in the interior of the furnace as also by means of several thermometers arranged at the furnace. At the beginning the temperature should amount at most to 40°, thereupon the temperature is allowed to rise during one hour to 60—70°. The surface of the mass gradually becomes vitreous and the unevennesses disappear, whereupon the pan is carefully removed from the furnace and covered with a glass plate until cool. After removal of the glass plate the zinc chloride absorbs water from the air, the lye is poured off, and the pan is filled with water and allowed to stand for some hours. The sheet is then carefully removed from the pan, laid on the glass plate and set up over larger pans so that the solution can drain off. The sheet is thereupon watered while lying on lead coated wire netting and is dried with the gradual application of heat, and if necessary in vacuo. The sheet which is slightly wavy is then while cold pressed out flat by application of strong pressure. In this way is obtained a material which is pale yellow in colour, is fairly transparent in its centimeter, and is not softened by heat but on the other hand always becomes harder. It is quite as elastic as a solid hard rubber, its breaking stress is considerably higher and it is a perfect substitute for vulcanized fibre. The further treatment of this material is the same as in the case of natural horn.

The fine fibres separated by centrifugal action are treated with a weak soda solution, pressed through a small filterpress, washed and dried, and after being ground in the edge runners serve as an admixture for hard rubber, the qualities of which are thereby much improved.

The zinc chloride must of course be regenerated as then only is a rational manufacture possible.

NEW PAPER MILLS IN NORWAY.

The ground wood pulp mill company, Ankers Trasliperi in Skaaningsfos, near Frederikshald, has commenced to erect a paper mill, and the Saugbrugsforeningen (Saw Mill Association) will soon begin construction of a paper mill, decided some time ago, at Porsnaes, on the same river, the Tista River. An electric power central will be built at the Tistafos waterfall.

The new sulphite mill in Obbola, North Sweden, has lately been started. It is the most northern sulphate mill in Europe and was built for a yearly production of 12,000 tons, but to begin with only 10,000 tons will be manufactured.

The Kotka Cellulose Mill, Kotka, Finland, which was destroyed by fire some time ago, will be rebuilt and the manufacture of sulphite pulp continued.

WHO'S WHO IN THE CANADIAN PULP AND PAPER INDUSTRY

William Price, President Price Bros. & Co., Quebec

(A series of monthly articles in the Pulp and Paper Magazine.)

By W. A. CRAICK

IN THE case of a large majority of Canada's captains of industry it has been the story of a climb from some humble position to the top of the ladder. As yet there have been few instances where a man has inherited the control of great enterprises. What with the tendency to form corporations and amalgamations, the son of the founder of any large industry is like as not to find himself side-tracked in the management, a result that is often as not of distinct advantage to the business, if not to the young man himself.

WILLIAM PRICE

William Price belongs to the exceptional class. He inherited not only the management but the actual possession of a great industrial estate when he was thirty-two years of age. What is more, he represented the third generation in control. Usually by the time a third generation presents itself, some measure of degeneration from the ability of the founder may be expected, but it was not so with the young Quebecer. He gave evidence of having even superior talents to those possessed by the man who preceded him.

One secret of William Price's notable success may be traced to the circumstance that he was not the lineal inheritor of the enterprises which his grandfather had established. Had he been aware from his youth up that he would of right have come in for the great estate which his uncles, the Price Brothers, had accumulated after the old man's death, certain undesirable influences might have made their impression on him. As it was, he was in a position in which he had to talk circumspectly or there might have been some danger of the property being devised to others.

Apart from the fact that he was a nephew and not a son, there is another rather curious feature about William Price and that is that he was born in Chile, the place of his birth being the town of Palca. His father, Henry Price, who was one of the younger sons of old William Price, had been as a young man of a roving and adventurous disposition. He had first of all learned the trade of ship's carpenter in the Gilmour shipyard, located at Wolfe's Cove just below the Price homestead, and having done so, soon after set off for South America. There he landed in Chile and for several years led a vicarious existence in that southern republic, amassing a moderate fortune in the interval. Later on he returned to Canada and took up farming in Ontario, moving eventually to Toronto where he died in 1899.

William Price was sent for his education to England and there he attended St. Mark's School at Windsor. When his parents returned to Canada, he was brought home and placed at Bishop's College School at Lennoxville, where he completed his training. In the meantime his three bachelor uncles, David, William and John, the original Price Brothers, had been building up an immense trade in lumber on the Saguenay and Lower St. Lawrence. All three had become notable figures in the country, David and John being successively Dominion senators and William a member of the Quebec Legislature. Following the death of William in 1880 and of David in 1883, John had become the sole partner. He looked about for some one to succeed him in the control of the business and selected his eldest nephew for the purpose.

When nineteen years of age, William Price entered his uncle's office in Quebec and for thirteen years was in training to assume the duties which John Price laid down on his death in 1899. During this time he filled various offices and absorbed all that was to be learned about the business. If his uncle had any doubts about his ability to handle the property, they were soon set at rest, for he exhibited great energy and resourcefulness and was above all most reliable, a quality which has always been in evidence among the Prices.

It is now fifteen years since the immense property of the Price Brothers passed into the hands of their nephew. In the interval much has been done to enlarge the scope of the business and to develop its latent resources. To William Price must be given credit for having branched out into the pulp and paper industry. Before his time the entire energies of the firm had been directed towards lumbering, but he soon saw the advantage of getting into the other line. With Mr. Porritt, a practical man, he started the Price-Porritt Pulp Co. at Rimouski about twelve years ago. Later he acquired the Jonquiere Pulp Co. near Chicoutimi. These were run independently until 1910 when on a reorganization of the Price Bros. Company, they were absorbed in the larger corporations. Recently by the erection of the fine large Kenogami Paper Mills on the Au Sable River, in which Mr. Price has taken a great personal interest, the Jonquiere Pulp Co. has been very much enlarged and its output considerably increased.

While William Price transferred his personal interests to the incorporated company of Price Bros. & Co., in 1904, becoming its president, he still holds a large majority of the common stock and a good slice of the bond issue. He remains the dominating force in all the Company's activities and this means a great deal where so much is involved. The Price Company to-day controls 6,400 square miles of timber limits, besides owning outright the lands of five seigneuries amounting to 300 square miles. It operates twelve saw and shingle mills, having an annual output of one hundred million feet board measure per annum. It gives employment to 4,800 men. Its limits are estimated to contain three thousand million feet of merchantable timber and twenty million cords of pulp wood.

Monarch of all these resources, William Price is a figure to be reckoned with in the industrial life of the country. He is now in the prime of life, a man of stout build and great vitality. He leads a very busy existence, keeping hand and eye constantly on all parts of the big machine. This involves a great deal of travelling about and he is probably away from his fine house on the Grand Allee in Quebec more than he is at home. He is not quite a slave to work, however, for he can always spare time for a romp with his children of whom he is very fond.

Neither is he a man solely intent on money-making and the advancement of his own personal interests. He has shown himself to be public-spirited and to-day, as chairman of the Quebec Harbor Commission, he is doing excellent work in building up the port. As an ex-president of the Board of Trade, an ex-governor of the Jeffrey Hale Hospital and a supporter of various philanthropical organizations, he has always done his share of good works. Old employees of the Price firm realize something of his generosity, for it is known that he is paying the pensions of several of them out of his own pocket.

In 1904 Mr. Price contested Rimouski in the conservative interest but was defeated. He ran for Quebec West in 1908 and won. He sat at Ottawa until 1911 when he tested his constituency again but without success. The victory of Mr. Borden, however, meant that his defeat was not without compensation, for he became all-powerful in Quebec as the local conservative leader. He has used his opportunities well and has been able to do a great deal for the development of his city.

Beyond the demands of his own business and the interests already mentioned, Mr. Price is connected with several other financial and industrial concerns. He succeeded his uncle on the directorate of the Union Bank and later became its vice-president. He is now honorary president of the Bank, having succeeded the late Hon. John Sharples in the position.

As a young man Mr. Price was quite expert as a football player and could also pull a good oar. Nowadays he takes respite from his work in fishing, a sport which he is able to enjoy under the most favorable conditions. He also does some shooting in the season. He owns several hunting and fishing lodges at various points on his property and is always quite generous in allowing his friends to make use of them.

If one were to seek the principal characteristics of Mr. Price, it would be to find that his honesty and integrity were most in evidence. He has no use for the tricky man and, when once he has been deceived by anyone, he is relentless in his condemnation. From others he always expects to receive the same kind of treatment that he metes out to them. He is quite outspoken in his opinions, says exactly what he thinks and can at times be decidedly abrupt. But at heart he is solid and is a good friend to those who deal squarely with him.

DISTINGUISHING PULPS IN PAPER.

Schwalbe's method of distinguishing sulphite and sulphate pulp in paper is concisely stated as follows: The paper is finely divided by a rasp or grater and freed from resin by extraction with alcohol and ether. In the case of very hard soda pulp papers which yield much dust on rasping, the paper may be extracted with alcohol and ether and finely divided by boiling for ¼ hour with water and then shaking with glass beads.

The dried pulp is treated with one-twentieth normal ferric chloride solution and heated at 60 degrees to 80 degrees C. until the pulp settles to the bottom of the vessel.

After carefully removing and rejecting any pulp adhering to the sides of the vessel, the mixture is filtered and the pulp washed with warm water, and treated first with 1 per cent. sulphuric acid and then 4 to 8 drops of a 2 per cent. solution of potassium ferrocyanide and heated for 5 to 10 minutes at 60 degrees to 80 degrees C. The treatment with sulphuric acid and ferrocyanide may be repeated, if necessary, in order to develop a more pronounced blue color.

The pulp is now separated (any adhering to the sides of the vessel being carefully removed and rejected as before), washed, and examined under the microscope. The fibres of sulphite pulp are colored deep blue, whilst those of unbleached sulphate pulp acquire a faint yellowish, greenish or brownish color, and those of bleached sulphate pulp either remain uncolored or are colored a faint blue. The relative proportions by counting the differently colored fibres.

H. M. Jones general manager of the Edward Partington Pulp and Paper Co., St. John, N. B., was in Toronto and other eastern points last week on a business trip.

The Howel Co. of Toronto, have been appointed selling agents for Ontario and the East of the pulp. The plant of the company is closed down at present owing to the rebuilding of an evaporator but it is expected that operations will be commenced again about the end of January. The output of pure kraft pulp will be forty tons per day. All the pulp is put through stone beater rolls in place of the kollergangs and some fine specimens are being shown.

THE KOLLERGANG

By LEO. SCHLICK, M.E.

THE origin of the kollergang dates back to remote ages. In China it has been in use for centuries to grind grain and rice. Before the twelfth century, Kollergangs were used by the Arabs and Italians, who recognized the disintegrating effect of stone discs forced to rotate round a fixed point and running on a horizontal stone plate. Thus by the kollergang—also called edge runner mill—has been introduced in many centuries.

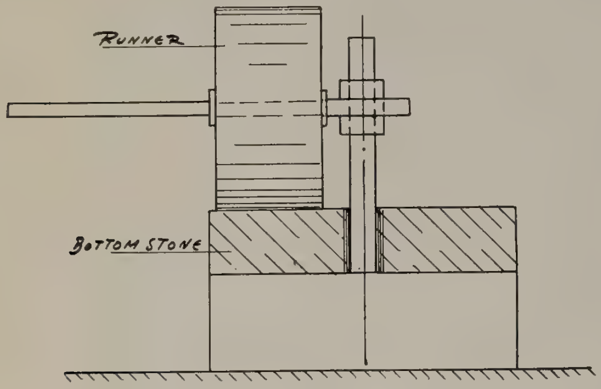


FIG. 1

Fig. 1. Chinese Kollergang with One Stone.

Around 1870 or so the Scientist, Ernst Kirchner of Saxony—in those days paper mill manager—recommended the use of kollergangs for the repulping of waste paper and for the pulping of lime treated straw pulp and the like. Mr. Kirchner went ahead and designed the "Kirchner's frame Kollergang," and introduced this machine in paper mills, the results being excellent. During the past thirty years their fame has been spread over the world. We find them in Canada giving the final touch to kraft pulp, pulping knots of sulphite mills, in the United States of America, repulping old papers and broke (Wisconsin District), also in England, Germany and Scandinavia.

The Kollergang is composed oft he following: Two vertical stone discs (runners), L-L are forced to revolve round a vertical shaft W, and are running on bottomstone B. The runners are provided with cast iron bushings and revolve on journals. The end thrust of the runners is taken by a collar, being connected to the journal. The bottom stone B, forms the bottom of a pan, which sides are of cast iron or wrought iron. As the material fed into the pan is to be reduced between the runner and bottom stones, the latter have to be movable up and down. This is done by means of cranks in modern types or by means of a steel frame acting as a crank. Cranks or steel frames swing on a cast iron cross by means of steel bolts. The drive is effected by means of a pair of bevel gears and a countershaft.

The different letters in figures 2 and 3 (a reproduction of an original drawing of Mr. Kirchner) indicate the following: L and L2 are the runners. Same are placed differently from the centershaft. V is to be the driving shaft; U the bevel gears; W the vertical shaft. W is held in position by means of bearing C and A. A small scraper S prevents the falling of pulp into the bearing B. S3 is another scraper, which scrapes the material underneath the runners. The cross Q is connected to the vertical shaft W and bears two steel rods C3 and C2 (Figure 3), on which frames M are swinging. Figure 4 shows a modern kollergang. The stone runners are held by means of cranks, the latter being connected to a cross frame of cast iron. The drive is effected by means of a vertical shaft and bevel gears.

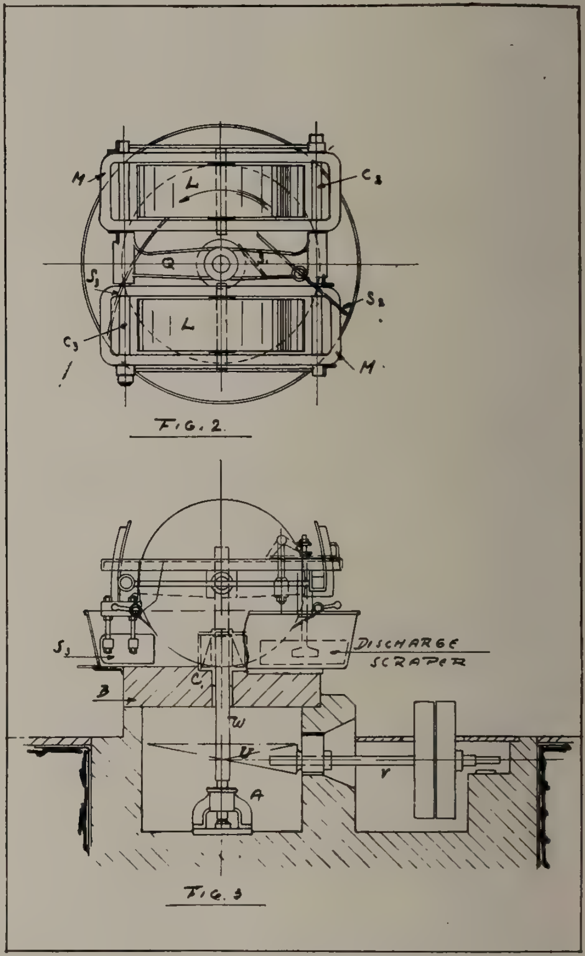


Fig. 2. Kollergang System Ernst Kirchner.

As stated above the material to be repulped or disintegrated is turned, mixed and scraped underneath the runners by means of steel scraper, same doing this work automatically.

In order to simplify the machine, these scrapers have been eliminated by shaping the pan as per Figure No. 5. The outer edges of the revolving stones turn and mix the material, and same is pushed underneath the runners by the runners themselves. This arrangement is very satisfactory and of great advantage where soft papers or already disintegrated pulp, etc., are to be treated. For playing cards and hard waste, however, the scrapers should be preferred as the pans can be designed less high, thus allowing to take out lumps of paper when required.

The disintegrating process is as follows and as per diagram figures 6, 7, and 8.

The runners rest their full weight on the material to be treated. Runners in figures 6 have the inclination to run in the direction of W, but are, however, forced to revolve round the vertical shaft and in the direction of W. Hereby a large friction between the bottom stone and the revolving runners is produced causing disintegration of the material to be pulped.

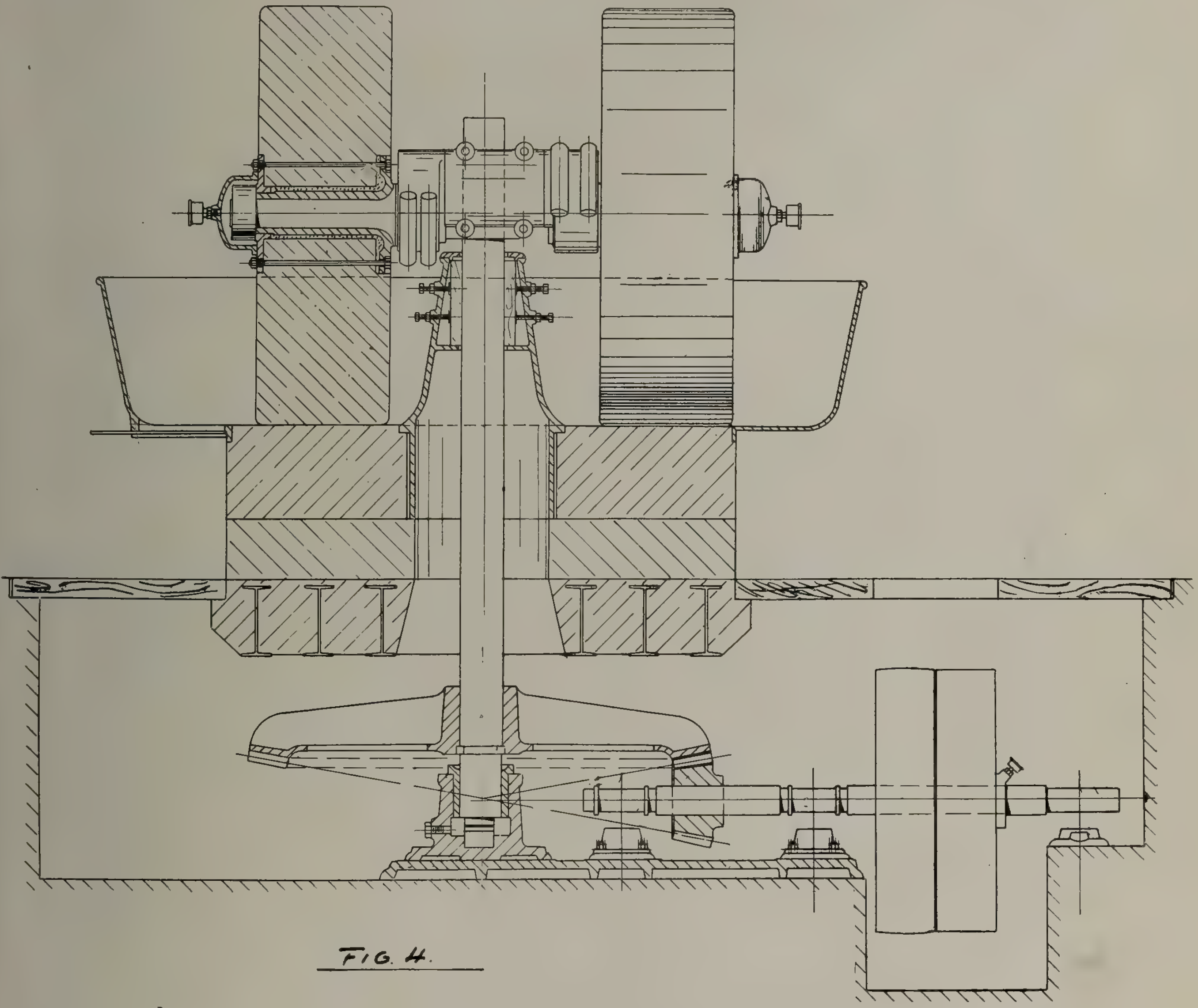


FIG. 4.

Fig. 4. Kollergang.

Stones arranged as per Figure 7, are inclined to run in the direction of arrow W, the friction being here still greater. The friction effect similar to Figure 7, is the one in Figure 8.

The number of horespower required by kollergangs is very low and ranges between 10 to 25 horsepower, according to size, whilst the capacity in old papers or broke is up to 12 tons per 24 hours.

The way of treating papers is as follows. Put the machine into operation, fill the pan with waste paper and moisten them to a certain degree direct in the pan by means of cold water. The pan will be sufficiently filled within 10 to 20 minutes and will contain from 500 to 2000 lbs. per charge according to the size of the machine. Hereafter, the machine will repulp automatically the waste within one or two hours into a good pulp without destroying any fibres whatever. The pulp is hereafter, emptied by means of a sluice. It is to be understood that no cutting or grinding occurs. The fibres are loose and rolled out of the fibre bundles and are preserved in their full length and strength. An addition of 10 to 30% of broke and old papers (clean white or of ordinary grade) gives the paper a splendid appearance, making writing paper better suitable for the purpose. As no boiling and the like is required, the loss in working up of old papers is nothing. All the small

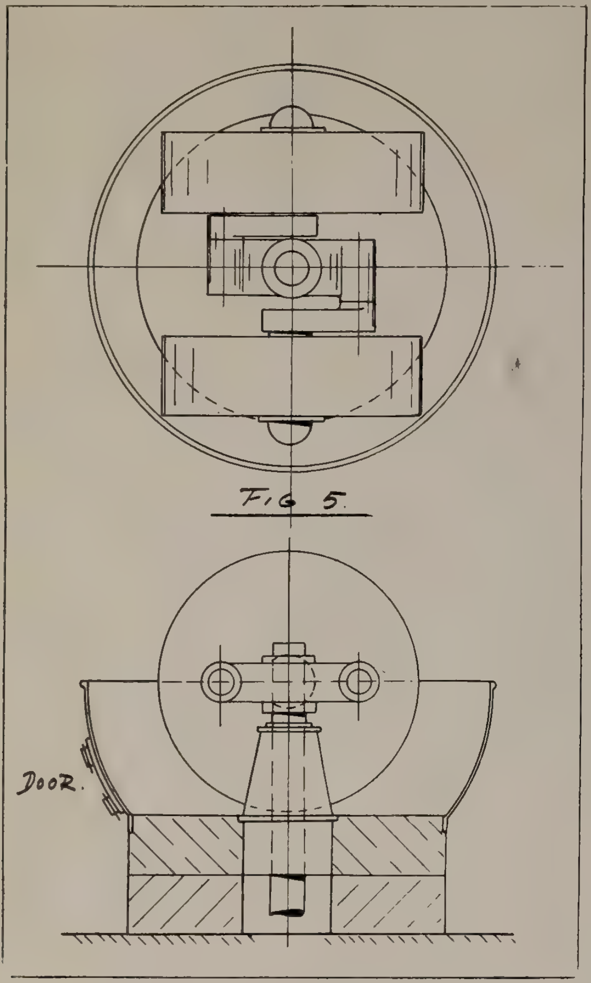
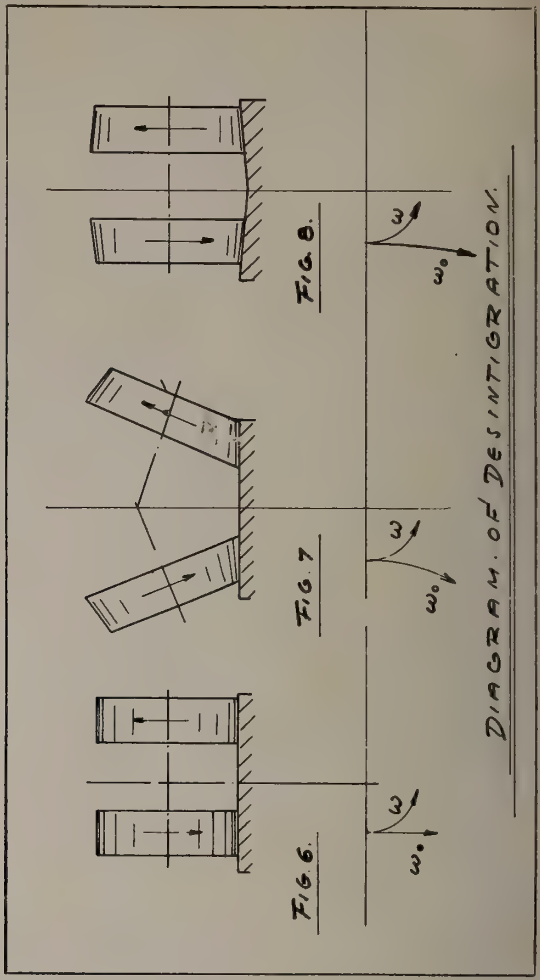


Fig. 5. Kollergang without Scraper.

fibres, the loading and seizing material is reclaimed. Of course, where printed papers have to be worked up into a good stock, the printers ink should be destroyed by boiling the material with a proper chemical solution.



Kollergangs are also largely used to reduce lime treated straw pulp. The knots are here properly disintegrated and rendered useful. The material of the runners and the bottom stones is hard sandstone, granite or basalt lava.

THE PRINT PAPER MAKER AND THE CONSUMER.

New York, N. Y., December 27, 1913.

Reports are current in this city from various interested quarters of the attitude of print paper makers towards consumers, in recent months. These reports point to a condition which would seem to argue the existence of a comprehensive agreement, both as to prices and to markets, between the American and the Canadian paper mills. The conditions as they are disclosed here reveal a certain uniformity of prices and the lack of competitive eagerness to sell paper that might be construed in the menacing legal phrase into "a conspiracy in restraint of trade and commerce."

Such a condition would engage the prompt attention of Attorney-General McReynolds and the Department of Justice, even if it had not already done so. This administration is alert to detect violations of the Sherman Anti-Trust Law and to punish offenders, and the Department of Justice always has an open ear for those who come to it with complaints and suspicions and facts to support them.

Print paper, such as is used in printing newspapers and the cheaper grades of books, was put on the free list by the Underwood tariff act. When the duty was removed on the Canadian imports, the assumption was that there would arise competition and bidding for the contracts of the paper consumers, and that possibly the price of paper would go down. While this has been realized to a certain extent, certain factors have stated most emphatically that prices have not only remained stationary, but in some cases have even gone up.

Inquiry at the Department of Justice at Washington at the present juncture is without avail. Mr. McReynolds will not make in advance statements about possible or probable prosecutions. But as these complaints are in almost every case, without support it is barely likely that Mr. McReynolds will pay any attention to them at all. As a matter of fact, newsprints that was selling a year ago for 2.25c delivered, is obtainable now from some mills at 1.95 c, and others at 2c., 2.05c., 2.10c., 2.15c., etc., up to 2.35c. This is surely indicative of the fact that the lowering of the duty has tended to depress prices, rather than make them firmer.

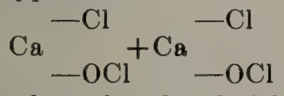
Notes on Some Recent Studies of the Action of Air and Carbon Dioxide on Bleaching Solutions.

By ROBERT KIRKPATRICK, M.Sc.

AMONG the chemical questions which have not been settled up to date is that, regarding the correct formula for Bleaching powder. For a long time, on account of its preparation from slaked lime by treatment with Chlorine gas, it was supposed to be a mixture of Calcium Hypochlorite and Calcium Chloride. The reaction in this case is represented as follows.

$$2Ca(OH)_2 + 2Cl_2 = \underset{\text{Bleaching powder}}{\underline{Ca_2(OCl)_2 + CaCl}} + 2H_2O.$$

The view that Bleaching Powder consisted of this mixture was opposed by the great chemist Fresenius. He claimed that since Calcium Chloride takes up water very rapidly when exposed to the air, Bleaching Powder containing that salt should also take up great quantities of moisture on exposure to the atmosphere. This is found not to be the case. There are a number of other experimental reasons which tend to show that instead of being the above mixture, it is a double salt of the Chloride and Hypochlorite.



$$Ca\begin{matrix}-Cl\\-OCl\end{matrix} + Ca\begin{matrix}-Cl\\-OCl\end{matrix}$$

In solution on the other hand, Bleaching powder acts exactly like a mixture of the Chloride and Hypochlorite. This is of course perfectly natural.

The value of a bleach depends upon the amount of available Chlorine, or, the amount of free Chlorine it is able to give upon decomposition. The standard guaranteed and insisted upon is 35% available Chlorine. The actual percentage often runs higher than this and by careful preparation, a 44% product is not impossible. There is a question, however, as to whether or not the product containing such a high percent is as efficient.

The preparation of bleach depends upon the fact that, on treatment of slaked lime with Chlorine gas, the latter is absorbed by the lime and Bleaching powder results. For this, the Chlorine is prepared in two ways. It is produced from common salt (Sodium Chloride, NaCl), either by chemical means or by electrolysis. Thus we have (1) Chemical Bleach and (2) Electrolytic Bleach.

It is a well known fact that Bleaching powder which has stood exposed to the air for a long time loses much of its available chlorine. Thus the necessity for using fresh samples when making efficiency tests.

This fact suggests the question, what action if any, has the air on Bleaching powder, and whether small amounts of Carbon Dioxide of the air have any influence on the liberation of Chlorine. The following is a summary of some experimental work done by R. L. Taylor (Jour. Chem. Soc.). These experiments are interesting in that they show, that Carbon Dioxide and air do have a very marked effect on Bleaching solutions.

Taylor tried the action of Carbon Dioxide both moist and dry, on known quantities of Bleaching powder. He also tried the action of purified dry air and ordinary air in the same manner. In all these cases he has an apparatus suitable for testing for Chlorine in the gases given off. It was found that when known quantities of Bleaching powder were treated with moist CO_2 the resulting gases which passed off from the reaction mixture, showed on being tested, the presence of nothing but Chlorine. This of course shows that moist CO_2 has a marked effect on Bleaching powder. Several trials showed this to be the case always. When the same thing was tried using perfectly dry CO_2 it was found that at first only Chlorine was evolved but that this gradually stopped as the powder became dry. This showed that moisture was necessary for the evolution of Chlorine gas.

Taylor explains the above reactions as follows:

It is a well known fact that sulphuric acid will liberate the Chlorine from Bleaching powder, the action taking place in two steps.

1. $Ca(OCl)_2 + CaCl_2 + 2H_4SO_4 = 2CaSO_4 + 2HOCl + 2HCl.$
2. $2HOCl + 2HCl = 2H_2O + Cl_2.$

Since the reaction which takes place in the presence of moist CO_2 is the same as above, he claims that the CO_2 and moisture produce carbonic acid (H_2CO_3). Although this is a very weak acid Taylor claims that it is strong enough to decompose the bleach in a manner similar to that in which the sulphuric acid does.

1. $Ca(OCl)_2 + CaCl_2 + 2H_2CO_3 = 2CaCO_3 + 2HCl + 2HOCl.$
2. $2HOCL + 2HCl = 2H O + Cl_2.$

It was found that pure air containing no CO_2 was passed through the Bleach solution, small amounts of Hypochlorous acid (HOCl) were produced. This is explained by assuming that part of the Bleaching powder is hydrolysed slightly as follows:

$$H_2O + Ca(OCl)_2 = Ca(OH)_2 + 2HOCl).$$

The most remarkable thing of all however, is the effect of ordinary air on Bleach solutions. It is of course well known that air contains a small quantity of Carbon Dioxide. At first the action of ordinary air produced an evolution of Hypochlorous acid. This diminishes rapidly until nothing but Chlorine gas is given off. Thus it is seen that there is a similar result produced by both CO_2 and ordinary air on Bleaching powder.

The observations of these experiments can be summed up as follows:

1. Purified air gives rise to a small amount of Hypochlorous acid when acting on a bleach solution.
2. Ordinary air at first causes the evolution of Hypochlorous acid in small amounts which gradually diminish until nothing but Chlorine is given off.
3. Pure CO_2 on bleach causes only the evolution of free Chlorine.

It is a wonderful thing that the effect of small amounts of Carbon Dioxide such as are found in the air should be so similar to that when pure CO_2 is used.

There are many compounds which are analogous to Bleaching powder in both chemical and physical properties but which are not cheap enough to use on a commercial scale. In a case like the above they are handy in that they furnish a means of comparison with bleach. It is, for example, well known that a mixture of Sodium Chloride and Sodium Hypochlorite in solution is analogous to a bleach solution. ($NaCl + NaOCl$) This mixture is prepared by the action of Cl on caustic soda ($NaOH$).

$$2NaOH + 2Cl = NaCl + NaOCl + H_2O.$$

It is also well known that this reaction goes in the opposite direction and is therefore reversible. It is natural to expect then, that a bleach solution will go in the same manner.

$$H_2O + CaCl_2 + Ca(OCl)_2 = 2Ca(OH)_2 + Cl_2$$

Since the action is reversible a point will be reached at which both reactions balance. The carbon dioxide of the air would then tend to keep precipitating the Calcium as carbonate from one half of the reaction thus preventing equilibrium and increasing the production of chlorine.

$$Ca(OH)_2 + CO_2 = CaCO_3 + H_2O.$$

This then explains the action of ordinary air upon bleaching solutions and I believe that the action of pure CO_2 is due to the same action. This explanation coincides best with our knowledge of the chemical action of Carbon dioxide.

This work is very interesting from a point of view of the manufacturer who uses bleach and desires to get the highest efficiency.

Belting

Do you keep a record of the duration and cost per day of every belt in your mill?

If you don't, start in to-day and you will in due time have figures that will set you thinking and make it possible for you to save a good slice of your belt bill?

Keep the record as detailed as possible!

It is a serious mistake to buy a belt, only because it is cheaper than other kinds and qualities; a cheap belt may not run more than a few months where a belt at the double price may run for years.

The kind of belt to be selected depends on the conditions under which it runs.

The old established leather belt is, as very expensive in first cost, not to be recommended in damp places or where it is subjected to high stress or where it is apt to be mechanically injured. It will work with great economy for transmitting power from steam engines, electric motors, etc., where they work under favorable conditions, also as driving belts for small machines as in a machine and carpenter's shop.

The woven cotton belt is in many cases the most suitable belt for pulp and paper mills. They are comparatively cheap in first cost, work well in moist places and do not slip easily if not too dry. The belt woven of fine, hard twisted yarn, the visible thread parallel to the belt is usually the best. It must be kept in mind that cotton belts shrink considerably by moisture and should therefore not be used where they are subjected to alternately getting wet and dry as the belt has to be well tightened not to slip when dry and when moistened will shrink and may bend the shaft and will make the friction in the adjoining bearings large, thus causing loss of power.

Cotton belt made of sheets of canvas, sewn together, is the cheapest in first cost but should only be used where the belt is subject to only very small stress as the sewing otherwise is rapidly worn out and the sheets separate.

"Camel hair" belts are more expensive than cotton belts but do not stretch as much and therefore cause less shut downs for "taking up." The weft, made of hair, is apt to rot and the life-time of this kind of belt is not very long. This kind of belt has, however, proved to work better than any other on heated pulleys, for instance on hot gas fans, because the hair weft insulates the inner cotton warp.

Rubber belts are uniform in width and thickness and do not stretch very much. They are suitable for machines where the stress is varying, as for instance, on wood chippers, as they spring to some extent without injury, are of considerable weight and adhere to the pulleys, thus preventing slipping, which is usually not the case with other belts when subjected to varying stress. They also run well vertically, depending on their large weight and are therefore extensively used for driving the different divisions of paper machines driven from over-head main shafts.

Balata belts are undoubtedly the best belts for transmitting power for any distance. They are light in weight in comparison to the power they can transmit, but need large pulleys as they have low adherent properties. They run well as half crossed belts but are very sensitive to moisture as this makes them slip easily.

For large distances as well as under certain conditions, specially for transmitting large amounts of power, it is cheapest to use rope drives; it is, however, outside the frame of these notes to go further into this particular kind of power transmission.

In designing a mill or a machine attention should be paid to ample dimensions as to diameter and width of pulleys. The extra cost of good sized pulleys is a mere trifle compared with the difference in cost of upkeep of belts running under high and low stress respectively.

When you decide on the thickness of a belt, take size of pulleys, power, speed and center distance in consideration. Remember that if you choose too light a belt, its life time will be short as the stress per square in. of sectional area will be large but remember that also a too heavy belt does not run well on a small pulley and that it adds to the friction in the beamings concerned.

A belt is like a pair of gloves in as much as workmanship and raw materials used have much more to say than the price and therefore a well known "brand" is often to be preferred though the price usually is considerably higher.

The limits of H. N. Price & Co., which were offered for sale on Wednesday, December 17th, in Quebec, by Messrs. Larue & Trudel, were put up at a knock-down price of $135,000. No bids were received and the property was withdrawn.

The Wayagamack Pulp & Paper Co., Ltd., have placed an order with the Sherbrooke Machinery Company for two three-roll hydraulic wet machines equipped with their sectional built up press rolls and spirally wound couch roll. Belgo Canadian Pulp and Paper Co., have also ordered three Sulphite Thickeners of their latest design and Henry Paper Compnay, Lincoln, N.H., are ordering a wet machine to be shipped across to the United States. This latter is an interesting fact, because it is so unusual to see Canadian machinery manufacturers supplying United States paper mills, and is a compliment to the Sherbrooke Machinery Company's work.

NOTES ON STEEL

SOME HINTS ON HARDENING AND TEMPERING

The following article by Mr. R. B. Hodgson, Member of the Institute of Mechanical Engineers and of the Crooks-Roberts Co., Sheffield, England, should be interesting to paper mill men, who are always anxous to know the materials which are used in all departments of the mill. The Steel used in the beater bars is always an important problem.

THE hardening of steel has been studied by numerous metallurgists, who have given a great deal of time and thought to their investigations with a view to establish a satisfactory theory to account for this very marked phenomenon in connection with steel. The theories brought forth by these eminent metallurgists are both numerous and varied.

In connection with the heat treatment of steel, microscopical evidence has proved most valuable, and I believe I am quite correct in stating, that if two samples of carbon steel selected from two different and distinct sources, but each giving approximately the same chemical analysis, be prepared for microscopical examination under normal conditions, their appearance will be practically the same.

Alloy Steels.

In reviewing carbon steel we see that an increase in the percentage of carbon is attended with increased hardness. In these days, however, we cannot base the definition of steel entirely on the peculiarity due to carbon, since there are other elements that can confer hardness to the iron. Iron readily alloys with different metals, such as aluminium, chromium, molybdenum, manganese, nickel, palladium, platinum, thodium, titianium, Tungsten, uranium, vanadium, and many very important and remarkable results are obtained from the resulting alloys. The only metals that we need consider for our purpose are chromium, manganese, and Tungsten since alloy steels containing these three metals lend themselves to, and are particularly suitable for cutting tools, which have to deal with work under conditions such that require the tool to be not only harder than can be expected in the case of ordinary carbon steels, but also capable of greater endurance under the two special circumstances of modern increased speeds, or to deal with the machining of very hard materials.

Chromium is used extensively in the production of special steels, as armourplates, axles, projectiles, and tool steels. The chrome iron-ores as found in either Asia Minor, Bohemia, France, Norway, North America, Silesia, and Shetland Isles, are the sources from which the alloy of iron with chromium is obtained. Ferro-chromium is prepared as a commercial article in a variety of grades, having different percentages of carbon and chromium. A grade specially valuable and used in the manufacture of high-class tool steel is 0.5 to 1 per cent. carbon, and 65 to 70 per cent. chromium. In the finished tool steel, such as very hard turning tools, the quantity of chromium varies between 2 and 3 per cent.

All steel contains some manganese, although the narrow limits of its contents 0.2 to 1 per cent., as usually present in ordinary finished commercial carbon steels, does not materially influence the properties of the steel. Manganese frequently occurs in iron-ores and is partially reduced along with the iron, 5 to 20 per cent., Manganese will result in the production of a white pig-iron in a highly crystalline condition, containing a large amount of carbon in chemical conbination, this is called "spiegeleisen," on account of the beautiful bright appearance of its crystalline plates, a condition which disappears if the manganese is increased above 20 per cent.

An alloy used extensively in steel making is that known as ferro-manganese, containing from 75 to 87 per cent., manganese alloyed with steel, manganese produces a material that is hard, tough, strong, and non-magnetic, and gives varying results according to the percentage. If 1 to 3 per cent. manganese be present the steel is brittle and unworkable, and up to 7.5 per cent. the steel may be likened to glass for brittleness, and beyond 7.5 per cent. the extreme hardness begins to disappear, but all manganese alloys possess extraordinary qualities of hardness combined with toughness, such as do not occur in the case of any other alloy. Manganese steels are so hard that they cannot be machined, but may be forged into various shapes as easily as very mild steel, and the ordinary process of quenching in water toughens but does not harden manganese steel, sudden quenching at a high heat will improve the tensile strength and elongation.

Tungsten is chiefly prepared from wolframore, and the metal readily alloys with iron to form ferro-tungsten, when alloyed with carbon steels tungsten plays an important part in helping to confer great hardness upon the steel, but in the absence of carbon, the presence of tungsten will have very small influence on the physical properties of the steel. Further, whilst tungsten has practically no appreciable effect on the magnetic properties in low carbon steels, it is of great value in high carbon steel, since by its coercive-power with regard to magnetism it greatly increases the power of the steel to retain the magnetism, consequently tungsten is an important metal in connection with special magnet steels, and a high percentage will improve the magnetic properties of the steel very considerably, the composition of the steel used for permanent magnets is somewhat similar to a special tool-steel but as a magnet steel is not required for cutting purposes, its composition is arranged so as to make most effective its properties of retaining magnetism.

The addition of tungsten will impart a fine-grained structure to a carbon-steel, and the fracture of a tool steel containing about 1.3 per cent. carbon and 3 per cent. tungsten may be likened to a mole's back so fine and velvety is the grain.

Self-hardening steels are alloys of iron, carbon, tungsten, and manganese, and in some instances chromium and other metals are added to bring about certain improvements in the qualities of the steel. These steels are called self-hardening, because if they are heated to a temperature of about 1,200 deg. C. nearly a welding heat, and allowed to cool in the air, they become very hard.

Hardening in General.

The hardening and tempering of a piece of steel is an operation which to the casual observer may appear a very simple one, but it is undoubtedly one of the most delicate operations in connection with mechanical art.

The quantity and variety of tools and other steel articles that are handled in the Midlands, are so numerous, that it is hardly possible to give a detailed description of the rules and methods for forging, hardening and tempering that can be applicable to the whole.

There are certain fundamental laws and principles relating to these matters, and if these are duly and properly observed, and correct methods adopted, they will invariably lead to satisfactory results. In my book, "Machines and Tools employed in the Working of Sheet Metals," which was published in 1903, I mentioned how necessary it is to exercise special care in heating a tool to the required temperature before plunging it into the cooling bath for quenching, the principal points of importance to remember being gradual and uniform heating, and the quenching to be done in a plentiful supply of fresh clean water and brine, or rain water and brine.

A steel high in carbon will harden at a low heat. as compared to the temperature necessary for a steel containing a low percentage of carbon, which fact makes it essential for the workman to have some knowledge as to the carbon-content of the steel he is handling, also he should at least have an approximate idea as to the correct temperature to which the steel had best be heated, what an important item the latter is—will be seen when we come to consider the actual application of the recalescence curve for fixing the correct hardening temperature.

At all stages in its manipulation, steel should be thoroughly and uniformly heated, that is in the forge and rolling mill, in the smith's shop, as well as in the hardening and tempering shop, for if a piece of steel is hotter in one part than another, the expansion is necessarily variable, consequently contraction in hardening will also vary, there being higher tension in one part than another, resulting in either a warped or cracked tool.

In the forge irregular heating means irregularity in forging, consequently inequality of tension in the article when in the rough forged state. But a reasonable amount of care on the part of a blacksmith will prevent trouble from this cause.

The Hardening Furnace.

The difficulties of uniformly heating a piece of steel in an ordinary blacksmith's fire, or in a coal fired furnace, are far too well known to need much comment from me. In the case of the coal fired muffle, by exercising a certain amount of care, by occasionablly turning round the steel, and by using a pyrometer in the muffle, it is possible to partly overcome the difficulties, but at all times experience and good judgment is necessary. Probably the next best way to ensure a regular heating is to use a gas fired muffle or furnace, which can be readily arranged to maintain an even and correct temperature by adjusting the gas supply, and in this way considerably reduce the risk of burning the steel and should a workman be unable to remove a tool immediately it is ready for quenching, the application of a pyrometer will guide him and so prevent disaster. An incidental advantage of the gas fired furnace is the increased cleanliness, due to the freedom from smoke and dust, which are inseparable where the ordinary blacksmith's fire or coal fired muffles are employed.

The Sand Table

Every Paper, and Pulp Maker, knows what a Sand Table is, and the intention with which it is erected, but many men who erect them, have never thought seriously on the theory of the arrangement. To get to business, the commonly accepted theory of a sand table, is, that it is to get rid of the heavier particles of dirt, which ought not to be among the fibres, but nevertheless always are. Well, the writer considers, that the Sand Table should not only be used, to get rid of the heavy dirt particles, but also be utilized to get rid of the light floating particles, as far as possible. It may be as an axiom, that whether one makes Pulp or Paper, that the flow of fibre and water, over the Sand Table should be steady, and regular. Heavy particles desire to sink to the bottom light particles desire to rise to the surface; but fibres of whatever kind, have a most objectionable habit of clinging to foreign matters. If they want to float the fibres hold them down, if they want to sink the fibres hold them up. It follows, from the uncontrovertible fact, that the broader and shallower the Sand Table is, the fewer fibres will the foreign particles have to fight against to get either upwards, or downwardw, as their composition may incline them. Therefore the boarder and shallower the Sand Table is, the shorter it needs to be, and the sooner will the foreign particles get where they ought to be. The question now comes, how can these particles best be got rid of. We will take the heavy particles first, as there are generally considdered most of them.

A common form of Sand Table consists of a series of riffles, that is, a frame, lying in the Sand Table proper, with a number of boards set at an angle of about forty-five degrees to the bottom, the fibre and water flow over these riffles, and it is supposed, that the heavy particles fall in between these boards, and rest where they fall, but they do not. Take an ordinary brook for example with ridges of rock, running across it, do you find much sand in the shelter of the ridges. No! you find a little, but not much, simply because every ridge makes a certain boil of the current, and many of the particles which ought, and want to settle, are carried along over ridge after ridge.

In practice one finds that between riffles, one gets a small proportion of dirt, and a large proportion of fibre. This fibre is practically all going to be wasted, because when a washing up has to be done, the fibre supply is shut off, and the water allowed to come on by itself, it cannot get at the settled fibres, and they are pretty well all lost.

Now is it not common sense to have your Sand Table arranged so that your fibre and water are drifting along quietly over a smooth floor arranged on a slight gradient so that the flow may be as slow as possible, consistent with the supply of the machine, and that this floor, should have at intervals, a box trap, about twelve inches wide and eighteen inches deep; into which the heavy particles which have sunk and are slipping and rolling along the smooth floor will naturally fall. ? One such box trap will do better work than twenty riffles, and the waste of fibre will be much less than when washing on the riffle plan. The adjustment of width of Sand Table, length, speed of flow, and number of box traps, depends entirely on size, and speed of machine, and on quality of materials used. So much for the heavy foreign particles, now, what about the light ones. These in general washing are generally allowed to go right along on the screens, which retain the large ones and pass the smaller ones. The writer suggests an arrangement which gives very good results, and is simple and easily arranged. The last few feet of sand table has a considerably steeper downward incline, than the first portion, at the top of this incline, what may be described as an adjustable slice is arranged, at a suitable angle. This is so set, that the floating particles are checked, thrown back slightly, and sucked off, the surface by an overflow, which discharges into the baby or auxiliary screen where the larger ones are retained, and such of the small ones as get through, do not matter much as the discharge from this screen delivers back to the commencement of Sand Table, and they get caught again as they come round.

An excellent form of Sand Table, is one, arranged so, that by a worm wheel gearing, it can be turned up at right angles, and be hosed clean in a very few minutes. This means a lot of time saved, in comparison with the laborious and disagreeable job of brushing, and hosing out a fixed table. It might be well to mention the fact, that in most cases Sand Tables are set much too high, so that before the fibre, and water reach the breast roll of machine, it has travelled over a wonderful arrangement of splashes and waterfalls, and is consequently full of froth bells which are most undesirable. Arrange your Sand Table to flow at just sufficient speed to prevent the fibres from sinking too much to the bottom. Then allow your fibre and water to slide quietly into the screens and from them quietly slip onto the wire. Working this way it is an absolute certainty that you will get fewer blotches and cleaner and better paper.

ALEX. ANNANDALE.

TRADE ENQUIRIES.

The Dominion Government Trade and Commerce reports contain the following trade enquiries. Readers of the "Pulp and Paper Magazine" may obtain the names of enquirers by writing to the Department of Trade and Commerce, Ottawa, Ont., and stating the number of the enquiry.

2240. **Lumber, clear pine.**—A South African importer asks for quotations on Canadian clear pine all sizes, planed four sides.

2241. **Lumber, pine shelving.**—Inquiry is made for quotations of Canadian pine shelving, quality 2, 1–inch x 12–inch by 12, 14 and 16 feet long.

2242. **Lumber, poplar boards.**—A South African importer asks for quotations on Canadian poplar boards ⅜-inch to 1-inch x 12, 14 and 16 feet long, planed four sides.

2257. **Wrapping paper.**—Samples and prices are requested by a South African merchant.

2258. **Paper bags.**—Samples and prices are asked for by a South African importing house.

2259. **Lumber and timber, all kinds.**—A South African importer asks for quotations on all kinds of Canadian lumber and timber.

2268. **Lumber.**—Inquiry is made by a South African importer for quotations on poplar boards ½-inch and ⅞–inch planes, 12 to 16 feet long.

2269. **Spruce deals.**—An East London importer asks for quotations on Canadian 3-inch spruce deals.

2274. **Wrapping paper.**—Samples and prices are asked for by a South African importer.

2275. **Paper bags.**—A Durban firm asks for samples and prices on Canadian-made paper bags.

2343. **Pulpwood.**—Manufacturers and exporters of mechanical and chemical pulpwood are invited to get in touch with Paris agent.

Full reports have just been received of the damage done by the huge storm of November 9th, and Aubrey White, Deputy Minister of Lands and Forests for Ontario, is making arrangements to have the fallen timber taken out this winter, before it is attacked by "borers" next summer. On lands under timber license damage was done in thirty-four townships. The storm centre was a short distance north and east of the Saulte Ste. Marie, and east of the township of Merrick on the Temiskaming and Northern Ontario Railway, below Temagimi, The attention of the licensees has been called to the damage and steps are being taken to save the blown timber although its removal will involve considerable expense over ordinary lumbering. To Crown timber the chief damage occurred in the Mississauga Forest Reserve and here eight limits, equal to four townships suffered. The licensees are operating at this point and the Department is insisting that they take out the slashed timber before it becomes a total loss, which has brought a request from the licensees for certain concessions if it is all taken out. North of Sudbury the damage was not as bad as was at first reported and arrangements have been made with the contractors on the construction of the Canadian Northern line in the district to cut the demaged timber for their work. In Janes and Dana Townships there was a serious blow down of about five and a half million feet board measure. An offer was received from Gordon & Co., lumbermen, who carrying on operations close to the devasted stretch, for five dollars per thousand board measure for the fallen timber and $12.25 per thousand feet for what remains standing. This offer has been accepted. There does not seem to have been any damage in the Rainy River and Port Arthur districts or north of Lake Superior or in the Timagimi Forest Reserve.

The new State insurance legislation of Ontario, has been favorably commented on in many quarters in Quebec and if the act should work out as well in operation as it promises in theory, in the opinion of employers an attempt should be made to have a Dominion statute framed along similar lines providing this is constitutional. If not it has been suggested that the matter should be brought before the various provincial governments with a view to having like measure adopted, making a uniform system from coast to coast.

NEW PATENTS

Judson A De Cew and Robert J. Marks are co-inventors of a new Double Beating Engine, having the inner and outer walls spaced apart according to the regular Marks design. The beater trough is as shown in the diagram.

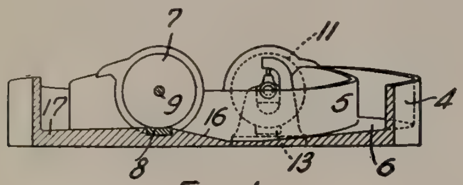


FIG. 1.

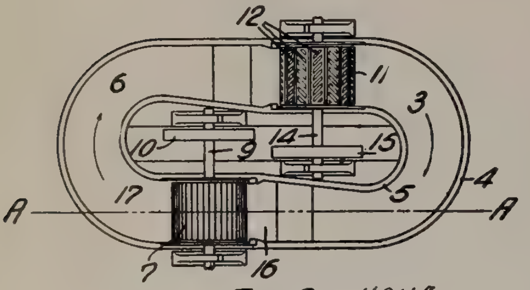


FIG. 2.

DANDY-ROLL.

By Albert C. McDonald, of Kalamazoo, Mich.

U. S. Pat. No. 1.071,329.

This invention relates to new and useful improvements in dandy rolls and is designed particularly to construct a device of this nature which will increase the efficiency of devices of this type. Dandy rolls are used upon the wet end of the paper machine and are designed to finish the top side of the paper and also water mark the same. As these rolls operate upon the paper while the same is in a soft or pliable condition, they will naturally gather or accumulate a quantity of foam water, and stock, which must be discharged by some method if the roll is to operate properly. In the rolls heretofore used, an attempt has been made to produce such a discharge preferably at the ends of the roll, but it has been found that these rolls have not been very successful, and in the majority of instances the rolls have become dammed and fail to operate as desired. The present invention is designed to overcome this objectionable feature in the rolls now in use by providing a means whereby a continual discharge may be had at the end of the roll, keeping the latter clear of accumulated foam and water and thereby preventing the rolls from damming.

Figure 1 is a diametrical view illustrating the shell of the roll flattened out. Fig. 2 is a side elevation of the dandy roll illustrating the various sections thereof, broken away for the purposes of illustration.

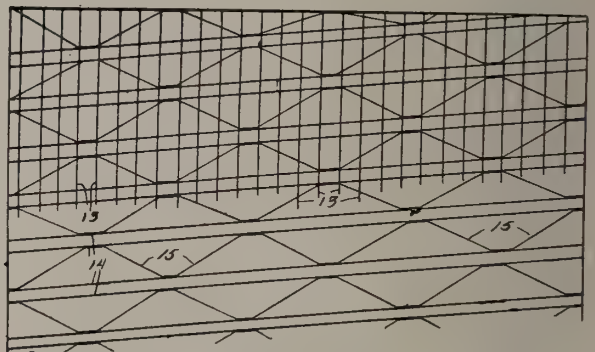


Fig 1

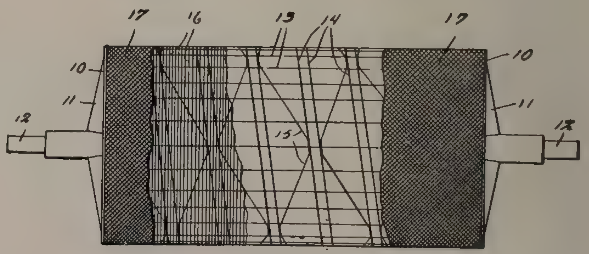


Fig 2

Referring to the drawing, 10 indicates a metal ring located at each end of the roll having a number, preferably 4, of radially extending arms, 11 located upon the interior thereof, whereby a stub shaft 12 is secured to each ring 10 for the mounting of the roll. A plurality of parallel longitudinal ribs or wires 13 are interposed between the heads or rings 10, said ribs or wires 13 constituting the inner surface or base of the shell of the roll. A pair of parallel wires 14, spaced substantially one-half inch apart are wound spirally above the ribs or wires from one plate 10 continuously to the opposite plate, 10, forming a channel upon the exterior of said ribs or wires 13, of about one-half inch in width. This channel is particularly constructed to conduct the foam, stock and water gathered by the dandy roll to the ends thereof, in order that the same may discharge, and the utility of the roll be in no way impaired thereby. In order to brace these channel forming wires 14, and to prevent any longitudinal movement thereof, a wire 15 is interposed between the wires of each set. This wire 15 is staggeredly arranged between the adjacent wires 14 and is secured to said wires by a soldering or other suitable means at equidistant intervals, as is clearly illustrated in the drawing. From this construction it will readily be seen that the wires 14 forming in combination a conducting channel, are prevented from any movement whatsoever upon the wires or ribs 13, and are retained by the wire 15 in a fixed position. The entire structure is wound with a spring brass wire 16 which extends throughout the entire length of the roll and completely covers the entire mechanism. An outer cover or brass wire gauze or cloth 17 encases the entire shell or roll and constitutes the bearing surface thereof.

By the foregoing construction it will be seen that as the roll operates upon the wet paper, the foam, stock, and water will pass through the brass wire, cloth or gauze 17 through the winding wire 16 and into the interior of the shell. The water, foam, etc will naturally, by gravity, be retained at the lower terminal of the vertical diameter by the roll, and thus will be positively contact with the channels formed by the wires 14. The rotation of the roll will therefore carry the foam, stock, etc., to one end of the roll, where it will be discharged.

* * * *

PAPER MAKING SUCTION ROLL.

By Robert Marx, London, England, Patentee.

Can. Pat. No. 147,950.

Suction roller vacuum couch roll comprising in combination a stationary inner suction box not capable of radial movement, an outer shell revolving thereon and longtitudinal and tranverse packing bars adapted to be pressed against the outer shell by means of water pressure.

* * * *

PAPER-BOARD.

By Charles S. Bird and George R. Wyman, of Walpole, Mass., Patentees.

U. S. Pat. No. 1,074,829.

The invention pertains to an improved paper-board, its construction and advantages.

Paper-board has of recent years come into somewhat extended use and its field of application is widening, this primarily by reason of the fact that lumber is becoming more and more expensive, and for the further reason that the manufacturers of such board are producing a better article than formerly. There is present, however, in the usual commerical paper-board of today one inherent defect which renders it unsatisfactory for many purposes, namely, the tendency to warp and buckle prior to or after it is positioned.

The main object of the present invention is to produce a board which will maintain its evenness and present a smooth surface or face, particularly so after it is fastened in place. This is accomplished primarily by charging the board, during its process of manufacture, with an appreciable amount of moisture, which moisture is, after being applied, slowly given off during a considerable period of time. Thus, when the board, with a certain percentage of contained moisture, is secured in place around its edges by tacking it, which is the usual manner of fastening the same, it becomes taut and maintains such position or conditions indefinitely.

* * * *

W. W. Andrews, Regina, Sask., formerly professor at Mount Allison University, Sackville, N.B., has patented a new roller for distilling Cellulose, Canadian Patent No. 149160.

A METHOD OF OBTAINING WATER-SOFTENING MATERIAL FROM SULPHATE LYES.

By Dr. W. Gunther, Karthausersrtasse 32, Kassel, Germany, Patentee.

British Pat. No. 9867.

This process relates to a method of obtaining water-softening material from sulphate lyes resulting from the boiling of organic substances, such as wood, straw, or peat, with alkalies. Sulphate and other alkaline lyes, both in dilute and concentrated solutions, have been employed in the softening of water; and drying has been resorted to with a view to recovering the alkalies, without paying attention to the organic substances containing therein. These defects are obviated when the drying is effected at as low a temperature as possible in order not to destroy the organic substances. When the evaporation is conducted under vacuum, and the layer to be dried is kept very thin, the process is accelerated, and the product obtained retains all its original contents.

The stability of the dry substance thus obtained is increased by fixing the free alkali by means of gaseous carbon dioxide, the fixing process being accelerated by the use of gases rich in carbon dioxide, and treating the lyes so as to fix the free alkali before the drying operation takes place.

TESTING METHODS FOR SULPHITE AND SULPHATE CELLULOSE IN PAPER.

By Prof. C. G. SCHWALBE, Eberswalde.

Several methods exist to recognize sulphite and sulphate cellulose in cellulose cardboards, for instance Klemm's Malachit-green—Rosanilinsulphate—test, and Schwalbe's method to test for rosin with anhydrous acetic acid and concetrated sulphuric acid. The latter method can of course, not be used to determine sulphite and sulphate celluloses in paper as a mixture of fibres, poor and rich in rosin, may be at hand in the paper, as well as rosin from the size. Klemm's method is only with very wide experience successful under the microscope, as it is difficult to observe the fine color differences.

A simple method to recognize the mentioned two kinds of cellulose does not at present exist. The problem is hard to solve, because the celluloses, both manufactured from wood, are closely related. Small differences in color are certainly noticeable, if small samples of sulphite and sulphate celluloses are colored in separate vessels beside each other with color solutions of the same strength and in the same manner, but these differences nearly completely disappear under the microscope. Satisfactory reactions for the two kinds of cellulose may be expected in two ways: by means of the incrusting substances or by means of the changes in the celluloses, which have been caused by thedigesting process. A cellulose for instance, which has been previously treated with an alkali, but afterwards completely washed out, absorbs, if again placed in alkali, more of this than a cellulose, which has first been treated with acids. The same applies to alkaline copper solution; soda-celluloses take up more copper from such a solution than sulphite-celluloses. It is, however, rather difficult to make the copper visible under the microscope. Red particles of copper oxidate may be noticed in the fibres when alkali-copper is reduced with dextrous and Seignette salt, but these particles are only faintly colored and irregularly distributed in the fibres. Also the transforming of the alkali-copper into black-copper sulphide does not give the desired result. The quantities of sulphide of copper separated out are so small and so finely distributed, that no black color, but only a brownish coloring is obtained. The freshly formed ferrocyanide of copper leaves the fibres and goes into the solution, is "bled out" from the fibres, if it is tried to make the alkali-copper visible by means of ferrocyanide of potassium. The copper taken up by the fibres may, however, be made visible by means of organic coloring substances. The red dye, Benzopurpurine 10B gives intensively blue colorings with copper-containing substances, depending upon the forming of a so-called copper lake, the copper salt of the pigment acid from the coloring substance. It is however, rather difficult to strike the exact conditions favorable for the forming of the blue combination.

This method to color the copper-containing fibre with benzopurpurine 10B becomes of more use, if the copper is fixed on the incrusting substances instead of on the cellulose. Sulphite cellulose takes up more copper than sulphate cellulose, when boiled in a solution of sulphate of copper; the copper remains even after energetic washing with hot water. The coloring with Benzopurpurine 10B gives very good results with unbleached, but it is sometimes not much of a success with bleached celluloses, because it is difficult, as mentioned above, to strike just the correct degree of coloring and washing out.

The desired result is obtained in the easiest and most reliable manner with an iron pigment. Unbleached sulphite cellulose takes up much more iron from a very diluted solution of chloride of iron than unbleached and bleached soda cellulose. If the fibres loaded with iron are vigorously washed with water and put in diluted sulphuric acid, to which a little of a solution of ferrocyanide of potassium has been added, so will the fibres of sulphite cellulose become colored deep blue, while the fibres of unbleached soda-cellulose become yellowish-greenish-brownish and bleached soda-cellulose fibres not colored at all or only faintly bluish. A blue coloring consequently makes the sulphite cellulose fibres recognizable under the microscope.

The following manner of executing the test has proved to be especially practical. The paper is first shredded on a common almond or chocolate shredder. It is absolutely necessary in order to obtain an even coloring to disintegrate the paper so finely, as many soda-cellulose papers containing sulphite cellulose will not become disintegrated by shaking with water, even with use of glassbeads. The use of soda lye for disintegrating the paper, is not advisable with color re-actions of this kind, as the soda lye dissolves parts of the fibres, which besides become changed on account of swelling up. The rosin is eliminated from the shredded material by means of alcohol and ether, so that it may not decrease the absorption of iron by the fibres. The disintegrating causes an abundant formation of fibre dust with very strong soda-cellulose, which causes disturbances in the microscopical test. The desired result, a very fine disintegration, is obtained, if the paper is first extracted with alcohol and ether, then boiled for about fifteen minutes with distilled water, and afterwards shaken with glass beads. A N divided by twenty (one-twentieth normal) solution of chloride of iron is now poured over the dry material on a water bath, and it is kept there so long at a temperature of 60° to 80° C. until the fibres, which in the beginning rise to the surface, have sunken to the bottom of the vessel, for which about half an hour is required. The pulp is then filtered off and washed with cold, or better with warm distilled water. The fibre particles adhering to the re-action glass above the surface of the liquid must be carefully swept off with some filtering paper, before the fibre pulp is poured out for filtration, because they have not absorbed sufficiently with iron, as they have not been long enough in contact with the chloride of iron; they consequently remain uncolored in the following coloring process, and can thus cause errors. The washed fibre material is now treated with sulphuric acid of 1% strength; 4 to 8 drops of 2% solution of ferrocyanide of potassium are added and all is afterwards heated on a water bath to 60° to 80°C. for 5 to 10 minutes. During this time the fibre material takes on a green or blue color; the last named coloring usually gives the best microscopical results. If the coloring is not enough blue, so may an after-coloring be effected with a few more drops of ferrocyanide of potassium solution, after having added more sulphuric acid. The liquid is then filtered off but first after the uncolored particles adhering to the glass again have been very carefully washed off, and the filtrate washed out. Microscopical preparations are made from the still moist fibrous material; the percentage of the weakly colored soda-cellulose fibres in comparison with the strongly colored sulphite-cellulose fibres, may be figured out by actual counting.

The method was first tried on a number of cellulose papers, which contained known quantities of unbleached soda and sulphite-cellulose, and has been found reliable. It is probably the incrusting substances, which hold the iron in combination: this seems at least to be indicated by the brighter shades on bleached celluloses containing only little incrusting substances. Only a repeated use of the method in the practice can give experience to judge, if there are any celluloses very low in incrusting substances among the very numerous market brands for which the method may not be useful.

The ratepayers of Chatham, Ontario, recently voted on a by-law for granting a bonus to Sommers Brothers Match Company, of Saginaw, Mich., who propose establishing a Canadian plant. The measure was defeated as it failed to secure a majority of two thirds of the ratepayers voting.

W. A. Preston, of Fort Frances Lumber Company, Winnipeg, in Montreal this week said that if steps were not taken to conserve the forests in the newer part of Ontario, they would disappear in twenty years. He advised re-forestration.

For the month of October the Canadian Western Lumber Company Limited, and the Columbia River Lumber Company, Limited, sold 8,107,000 feet of lumber, as compared with 13,753,000 feet in the corresponding month of 1912. From January 1st to date, the lumber sold amounted to 138,793,832 feet, as compared with 157,602,500 feet last year.

BRITISH TRADE NEWS

SPECIAL TO PULP & PAPER MAGAZINE

The Monroe Bridge Company, a new corporation with a $35,000 capital, which recently bought the business of Ramage Paper Company at Monroe Bridge, Mass., is made up of the following officers: Martin A. Brown, president; George A. Greene, Treasurer and Manager. The property includes not only the mill but the whole village of Monroe Bridge. The business will be increased, since the mill having connection with the water powers on the nearby rivers, will have all the power it needs during the seasons of slack water at its own plant.

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Complaint from his district on the interpretation of the tariff law in regard to straw pulp was taken up on December 17 in Washington by Representative Treadway, who will consult Representative Underwood on the subject and if necessary will appeal to the Treasury Department. Under the old law, Mr. Treadway was informed, this pulp was taxed at $5 per ton. By the new law, it is argued, it should come in free, but instead the duty has been increased to $7 per ton. Finally, the complainants assert that although the duty has been raised on the raw material, instead of being wiped out, the protective duty on the finished product has been lowered.

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Increases averaging 12c. a hundred pounds in freight rates on wrapping paper and pulp wood, in car loads, from Mississippi shipping points to Baltimore, Philadelphia and other eastern points, were suspended on December 17 by the Interstate Commerce Commission until April 17, pending investigation.

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An official of the United Paper Board Company, commenting on the business of his company stated to your representative this week: "The nature of our business of course depends on general trade conditions, and while things are not as good as could be desired, we are getting fair volume of orders. I am not as pessimistic as some people, and think after the questions which are now hanging fire in Washington, are settled things will work out all right." It has been announced that the capital of the United Box Board Company, has been reduced from $15,000,000 to $15,000, which is the final step in the reorganization.

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An involuntary petition in bankruptcy has been filed against the Niagara Coated Paper Company by the Eddy Paper Company of Three Rivers, Mich.; the Casein Manufacturing Company of New York; and the Monarch Paper Company, of Kalamazoo, Mich. The petitioning creditors claim the Niagara Paper Company admitted its insolvency to them in writing about four months ago. Judge Hazel, at the request of the creditors, appointed Charles J. Staples, of Buffalo, N. Y., temporary receiver of the company's property and directed him to continue the business until further notice. Mr. Staples was placed under $10,000 bail. The Eddy Paper Company has a claim against the Niagara company for $8,000, the Casein Company, $3,237,50, and the Monarch company $5,300. All of these claims are for merchandise shipped to the Niagara Company.

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The Champion Coated Paper Company, of Hamilton, Ohio, has just received from the Postal Department at Washington the biggest contract ever awarded for postal card paper. The contract calls for a minimum of 6,000,000 pounds of post card paper a year for four years. The total amouut of the contract aggregated $1,110,000. Heretofore the authorities at Washington have been entering into contracts for post card paper each year, but the present administration decided to call for bids for a four year contract and as a result lower bids were received, according to Walter Randall, secretary of the Champion Company, whose company has been furnishing this paper for quite a few years. He also stated that the filling of this contract would keep his company running practically at full capacity for the next four years.

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Edward W. Elsworth, who for a number of years was secretary and general manager of the Norwood Paper Company, one of the Remington group of newsprint mills of northern New York, has just been made a director and secretary of the Grapefruit Products Company, Inc., of Watertown, N.Y., and has opened an office at 33 Sherman Building, that City. Mr. Elsworth severed his connections with the Norwood company several months ago, and a few days ago decided to go into an entirely separate line of business.

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The last of the criminal prosecutions against the officers of the Baylesso Pulp and Paper Company, of Austin, Pa., growing out of the flood which devasted that village on September 30, 1911, destroying eighty lives, and three millions of dollars in property, were nolle prossed at Coudersport, Pa. on December 10, by Judge John Ormerod. Private prosecutors presented petitions requesting the step on the ground that they believed that there could be no conviction of the accused for voluntary manslaughter under the facts in the case. Settlements of the civil actions for damages against the company opened the way for securing the consent of the private prosecutors to drop the criminal cases.

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J. N. MacDonald, manager of the Mac-A-Mac corporation, of Brandreth Lake, N.Y., stated on December 19, that the past summer had been a very prosperous one for his corporation. About 60,000 cords of pulpwood have been cut during the past summer, and it is ready to be drawn to the tracks of the railroad belonging to the corporation as soon as snow sets in. He also said that as soon as the snow is on the ground so that the logs can be drawn on the skidways, that the shipments will begin to the St. Regis Paper Company at Deferiet. It is estimated that it would take a train forty miles long to ship out the entire output. Mr. MacDonald expects that there will be a daily shipment during the winter months of about thirty cars. Last winter about 45,000 cords of pulp wood were shipped from Brandreth Lake to the St. Regis Company. During the past summer the corporation has extended its railroad about eight miles and now has a mileage of nearly twenty miles. Two engines belonging to the company are used in drawing the timber to the M. & M. branch over which it is shipped to Remsen and then over the St. Lawrence division to Deferiets.

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The International Paper Company has filed with the Interstate Commerce Commission a complaint against the rates on pulp wood which have been brought into effect on the Canadian Northern, Grand Trunk, Canadian Pacific and their American connections. It is charged the new tariff contains a large number of increased rates from the various points at which pulp wood is produced and shipped in Eastern Canada to points at which wood is manufactured into pulp in New York and other Eastern points. The general result of the new tariffs, it is asserted, is to increase the rates on the pulp wood throughout this territory from one-half to three cents per 100 pounds, averaging approximately 11% over the former rates. The effect of the increased rates, it is said, will be to add to the cost of paper at least 56 cents a ton and restrict the importation of any pulp wood from Canada to mills in New York State. It is charged that three increased rates were established in order to impose indirectly an export tax on Canadian pulp wood and not because the rates formerly in effect were unremunerative or unreasonable. The commission has been asked to fix a reasonable rate on pulpwood.

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The mill of the International Paper Company, at South Glen Falls, N.Y., is running full head, better than it has in years, according to one of the officials of the company in an interview this week with your correspondent. The high water is directly responsible for this boom and with the aid of the new power dam, enough has been supplied to put every machine in operation. All of the six machines in the mill are running and an enormous quantity of paper is being turned out daily.

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The new 2,368 horsepower plant of the Centralia Pulp & Water Company was started recently at Grand Rapids, Mich., by C. Nason, manager of the company. The ceremony was witnessed by the stockholders and guests. Speeches were made by Mayor Joseph A. Cohen, of Grand Rapids; L. M. Alexander, president of the Nekoosa-Edwards Paper Company, and Howard Weiss, of the forestry of the State university.

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Reports so far received regarding logging during the coming winter months in the State of Maine, indicate that the log cut will be very small, if compared with previous corresponding seasons. It is the opinion, however, of those thoroughly familiar with the situation, that this situation will not continue long as many of the large operators and mill owners will have large crews in the woods throughout the season. Many of the contractors already have their crews in the woods, and there was never a time when the Boston and Bangor employment agencies had a larger demand for woodsmen. Heavy hardware dealers who sell woods outfits say their business this year exceeds that of former years, and they have been informed that logging will be carried on during the winter on an exceptionally heavy scale.

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The industries of Skowhegan, Me., have been increased by an innovation in the line of paper-making for this part of the State—that is, manufacturing paper from the waste of wool mills, old papers, old rags and many other kinds of waste materials. This business is now carried on by the Savage Manufacturing Company, and twenty-six hands are at present employed in the work. The mill was started by E. L. Savage as a ground wood pulp mill, but the present product makes the mill unique for this section. He is at present making fourteen grades of paper, and contemplates the making of more in the very near future.

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The Crystal Paper Company has filed an application for a charter in the State of Ohio, with an increased capital from $60,000 to $120,000, and changing its main office from Lima to Middletown. It is proposed by the change to make the preferred stock bear dividends at the rate of 7%. The company has been making steady progress in its manufacturing end for some time. About a year ago it built an additional plant at Amanda, Ohio, in the lower part of the Miami Valley, where the principal mill is located. The new mill was built along the banks of the Miami and Erie Canal. This makes two separate mills under the management and control of the Crystal Company. It is understood that the increase in capital is for the purpose of meeting the payment of bonds now falling due on the plant, and also to make some more improvements in the mill that will increase the efficiency of the plants in the way of adopting more improved machinery.

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The Mun~~in~~ising Paper Company of Marquette, Mich., is rapidly increasing its stride. Materials and equipment have just been ordered and contracts let for extensive improvements in the plant, work on which will begin about the first of January. There will be installed in the power plant, a 400-kilowat generator, driven by a 650-H.P. engine. At present the plant has two 750-H.P. engines and generators, in addition to which it is supplied with 300 and 750-H.P. from Au Train River power plant, varying with the volume of water in the river. Super heaters to be installed in the south battery of four boilers will convert saturated steam into dry steam for the digestors for cooking pulp, resulting in shortening the time of that operation, a saving of chemicals and the production of a better grade of pulp. In the paper mill vacuum pumps and valves will be installed in connection with the heating and drying systems. The whole machine room ventilation system will be modified, and numerous other improvements made.

The Hon. L. Taschereau, Minister of Public Works in the Quebec Government, has introduced a Bill respecting the toll to be charged for the logs and timber floated down rivers and water courses. It is proposed to give powers to the Running Waters Commission, of which Hon. S. N. Parent is chairman, to fix the amount of the tolls. On the first reading, Mr. Telier suggested that the lumber companies should be held responsible for floods or damage caused by the breaking of dams, and Mr. Taschereau promised to consider the suggestion.

PULP AND PAPER NEWS

The Southam Press of Montreal, who, as reported in our last issue, are building a ten-story extension to their premises in that city, will have the same completed during February and will use most of the extension for high class office space.

The new mill of the Alberta Saskatchewan Straw Products Company at Moose Jaw, Alta., is practically near completion and will soon commence operation. They will use flax straw to manufacture board and building paper.

Extensive alterations are being made in the new Price Brothers mills at Kenogami on account of the original designs not meeting the conditions. They are at present adding two more boilers with dutch ovens to take charge of the waste from the wood room as it has been found that the original design using Murphy stokers which mixed the waste and coal was not satisfactory. A great many other alterations are being made throughout different parts of the plant.

The big lumber case of the Northern Crown Bank and the Great West Lumber Company, Limited of Calgary, was concluded last week and will go before the Privy Council. This has been a most expensive litigation and a great deal of money has been spent on both sides.

"There is no truth in the story about the pulp and paper mills merger as far as we are concerned," declared Mr. M. J. Scanlon, vice-president of the Powell River Company, at Vancouver, on the 11th inst. "We are very satisfied with the prospects of our enterprise," he continued, "and we have no intention of disposing of it. You can make that as emphatic as you like. We have just completed a big addition to our plant at Powell River which almost doubles the output and we have orders for a long time ahead."

The Cannon Lake Lumber Company, Ltd., has been incorporated with head office at Winnipeg, Man., and capital stock of $100,000. The incorporators include P. P. Elliott, Fort Frances; W. L. McIntosh, A. C. Miller and B. C. Deacon, all of Winnipeg. The rights of the company include the carrying on of logging and lumber manufacturing business in all its branches and the manufacture and sale of pulp and articles manufactured from pulp. The new company has, it is stated, taken over all Mr. P. P. Elliott's timber business in that district and will carry on the timber and tie business the same as conducted hitherto by Mr. Elliott.

Thomas Gibson, of Toronto, who is secretary of the Lake Superior Corporation, has been elected a director of the Spanish River Pulp and Paper Mills, replacing J. Frater Taylor, of Sault Ste. Marie, who resigned a few weeks ago owing to pressure of other duties. The accounting department of the Spanish River Company, has been removed from Toronto to Saulte Ste. Marie, to the offices of the Lake Superior Paper Company, under the direction of Lionel Lumb, comptroller of the company. The cost branches in connection with the mills at Espanola, Sturgeon Falls and Saulte Ste. Marie, are now conducted at each of these places. The executive and sales offices remain in Toronto. Joseph Krockenberg, who for some months has been superintendent of the Espanola branch of the Spanish River Pulp and Paper Company, under Joseph Slater, general superintendent, has resigned to accept the position of superintendent of the new news-print mill of the Donnacona Paper Company at Donnacona, Quebec, which will be in operation in a few weeks. Previous to joining the Spanish River, Mr. Krockenberg was night boss under John J. Ross, Superintendent of the plant of the Minnesota and Ontario Power Company, at International Falls, Minn. He has extended experience and is well qualified for his new post.

The Interlake Tissue Mills, of Merritton, Ont., are now manufacturing sanitary crepe table cloths for use at church festivals, cafes, banquets, etc., The standard size is 52x72 inches and already there is a good demand for this line. The company report that the sale of crepe napkins and sanitary crepe towels is rapidly increasing.

The new board mill of the Hinde and Dauch Paper Company of Canada, has begun operations in Toronto and the new machine is working smoothly. O. H. Moore, manager of the company, is well pleased with the quality of board that is being turned out. The capacity of the plant is forty tons per day and all kinds of box board will be made, including jute and chip board from old papers and sulphite. J. J. Dauch, President, and Sydney Frohman, secretary of the company, came over from Sandusky, Ohio., a few days ago to witness the inaugural ceremonies. The new building is 264 feet long and 60 wide, four stories high, and constructed of brick, cement and steel. The structure is well lighted and admirably appointed. The new machine, which was built by the Downington Manufacturing Co., of East Downington, Pa., is 124 inches wide, it is equipped with four cylinders, three sets of press rolls and one Millspaugh suction press. There are six beaters of 1200 pounds capacity furnished by the Waterous Co., of Brantford, and four Jordans from the Noble & Wood Machine Company., of Hoosick Falls, N.Y. The three upper floors of the new addition are used for the manufacture of corrugated paper boxes and the capacity of this portion of the plant will be more than doubled. George Brown late night superintendent of the board mill of J. R. Booth at Ottawa, has been appointed superintendent of the Hinde and Dauch board mill and has entered upon his duties.

John R. Barber, the veteran paper manufacturer, who has been in rather poor health for some months is now at his home in Georgetown and able to be about every day and attend to private business.

E. R. Colbert, formerly superintendent of the coating mill of the Georgetown Division of the St. Lawrence Paper Mills who resigned some time ago, is devoting his attention to the new mill which is being erected by Gummed Papers, Limited, in Brampton, in which he is a leading shareholder along with Capt. R. R. Barber. It is expected that the new industry will be under way in a few weeks. Roy Kercher is now in charge of the coating mill at Georgetown, having been assistant to Mr. Colbert for some time.

J. L. McNicol, of Toronto, left this week for Millerton, N.B., where he has been appointed manager of the New Brunswick Pulp and Paper Company's plant. It is understood that James Beveridge is retiring. Mr. McNicol is a thoroughly experienced paper-maker in all branches of the trade, and previous to coming to Canada eight years ago, was employed in some of the leading mills in Scotland and England. He also spent fourteen years in India. He was in charge of the Mille Roche Mill for some time and later the Montrose plant at Thorold. For four years he was with William Barber and Brothers, at Georgetown, three years in charge of the Barber mill and for one year superintendent of the coating plant, retiring some eight years ago, after which he spent several weeks on a visit to his old home in Scotland. For the past few months he has been associated with A. M. Huestis, of Toronto, representing several Old Country and American mills making special lines of paper.

George Coates, the employee of the Lincoln Paper Mills who lost both arms by having them drawn into a stack of calenders at Merritton some time ago, has returned to Toronto. The unfortunate man was presented, as already stated in these columns, with a purse of twenty-seven hundred dollars by the residents of St. Catherines and Merritton. Coates, who is a former member of the Toronto Street Railway Men's Union, received a further gift last week of three hundred dollars from his associates on the road.

The Toronto Paper Manufacturing Company, whose mills are located at Cornwall, have reduced the dividend on the stock from an eight to a six per cent. basis. It will be remembered that some months ago the dividend was suddenly raised from six to eight per cent. The reason given by the directors for the present reduction is the unsettled condition of trade in general and the fact that a more conservative policy is the better one to pursue until the market for book and writing paper improves. The company is now turning out loft-dried ledger and bond papers of a very fine quality and the overhauled sulphite plant is giving one third increased capacity. Garnet P. Grant of Toronto, has resigned from the Board of Directors but the vacancy has not yet been filled.

The F. N. Burt Company, of Toronto, have declared their regular dividend of $1\frac{3}{4}\%$ on the preferred stock and $1\frac{1}{4}\%$ on the common. The Pacific-Burt Company, of Toronto, have declared a quarterly dividend of $1\frac{3}{4}\%$ on the preferred and 1% on the common. The Laurentide Paper Company, have declared their regular quarterly dividend of 2%. Smart-Woods, Limited, have declared a quarterly dividend of $1\frac{3}{4}\%$ on the preferred and $1\frac{1}{4}\%$ on the common stock.

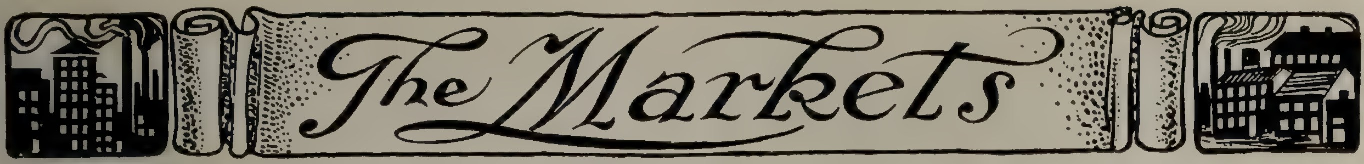
M. Ivan Bunge of Paris, France, was in Toronto last week on his way to Owen Sound, where he bought a large quantity of wood for the firm of Bunge Brothers of Harve, importers of white birch, rock elm, and maple.

I. H. Weldon, President of the St. Lawrence Paper Mills, Toronto has returned from a visit to Indianoplis, Indiana. He and his brother T. A. Weldon of Thorold, manager of the Montrose Division, spent New Years with their father at St. Thomas, Ontario, who although in his ninety-second year, is still hale and hearty.

Mr. Whyte, manager of the Abitibi Pulp & Paper Company, at Iroquois Falls is optimistic that all the plant will be installed in the mill by April. It will then be a matter of a few weeks until it is running. The wet machinery and wood room builders have been covered in and the men engaged in construction are now working in comparative comfort. The machinery will begin to arrive in January and the skilled mechanics who will be imported will at once commence to put it in. For their comfort and that of the staff an hotel with thirty bedrooms has been completed. It will be equipped with all modern conveniences. The clearing off of the townsite where houses will be built for the married employees has commenced. Pulp wood has been taken off for a mile strip three-quarters of a mile west of the mill. The deforestration is being done scientifically so that sufficiently young trees are being left to form a wind break. There are all told now in the bush 250 men cutting pulpwood for the company. Two of the many parties are cutting near the mill and two more between Iroquois' Falls and Matheson along the Black River; the remainder are using Abitibi Lake as the seat of their operations.

Messrs. McCrea and Tobin of the Bromtpon Pulp & Paper Company, this week sold the property of the Chaudiere Lumber Company, of which they were the individual owners, to Jean Breakey, of Quebec. The property consists of about 15,000 acres of timber lands, one-third of which the company owned in fee sinple. and two-thirds the cuts of timber only, also the improvements at Chaudiere. The price is understood to have been about $350,000. In addition, the purchasers take over all contracts for wood to be cut this winter, re-imbursing Messrs. McCrea and Tobin for advances made and expenses. The Chaudiere Lumber Company was organized about seven years ago for handling pulpwood and ties. It originally consisted of several shareholders, but recently Messrs. McCrea and Tobin have been the sole owners.

Mr. Charles Ponsonby of the Canadian Agency, Limited, has returned to England after a visit of inspection to the various enterprises in which his company is financially interested. Up to the present time the management oft he Spanish River Company have had difficulties to contend with, and the company has only recently come out of the construction stage; in fact, during last year its production was only at the rate of 35,000 tons per annum, whereas the output which is now expected is about 64,000 tons. In addition, the company suffered in the fall in the price of the commodity, owing to several new mills coming into the market during the past two years. "I satisfied myself that the over-production which has affected the paper companies during the past year or two, has now been practically absorbed and it is reasonable to suppose that the price of the commodity will gradaally rise. This will be a great benefit to all paper companies. The alliance recently formed between the Spanish River Company and the Lake Superior Paper Company at Sault Ste. Marie, should be to the advantage of both companies, not only in eliminating all competition in that district of Ontario, but in the reduction in operating expenses."



The Markets

CANADIAN MARKETS.

There is a good demand for news and all the mills report that the usage of print paper during the past month has been exceptionally heavy owing to the large editions of the daily papers and special holiday numbers. Prices are firm and it is generally agreed that during the present stringency, the news mills have come out the best owing to the steady and increasing demand for their product. Book and writing plants are only fairly well employed and business has not picked up to the extent that it was hoped it would. However, better things are expected after the holidays. Contracts from several large departmental stores, who issue their spring catalogues at this season of the year, have helped out matters in the book and coated paper lines somewhat. The wrapping paper situation appears about the same and the mills are industriously looking for orders. One noticeable feature about the demand for papers used in Christmas trade was the increased usage of glazed kraft, which seems to be replacing fibres and manilas to some extent. There is a fair demand for ground wood and prices are holding very well. In sulphite the situation is a little easier and quotations since the United States embargo has been removed from the foreign product are lower than they were at this time last year, by two or three dollars. In the rag and paper stock market, mixed papers are a little easier and there will not be much business doing until after the holidays. Several paper jobbing houses are busy taking stock at the present time. The annual meetings of many paper houses and mills will be held during the coming month and some concerns will show an increase in volume over 1912 while others report a slight falling off. On the whole, the paper trade has not suffered as severely as some lines of business and the year just closed, considering the augmented tonnage in all brands and the tightness of the money market, has been fairly satisfactory. Quotations f.o.b. Toronto to consumers are as follows:

Paper

News (rolls) $42 to $44, delivered.
News (sheet) $46 to $50, f.o.b., mill
Book papers (carload) No. 3. $3.75 to $4.50
Book paper (ton lots) No. 3, 4c. to 4.50
Book paper (carload) No. 2, 4.25c.
Book paper (tons lots) No. 2, 4.50c. to 5c.
Book papers (carload) No. 1, 4.75c. to 5.25c.
Book papers (ton lots) No. 1, 5.25c. to 5.75c.
Writings, 5c. to 7½c.
Sulphite Bond, 6½c. to 8½c.
Fibre, $3.00 to $3.75
Manila B., $2.50 to $3.25
Manila No. 2, $2.75 to $3.50
Manila No. 1, $3.25 to $4.00
Unglazed Kraft, 3.75 to 4.50
Glazed Kraft, $4.25 to $5.00

Pulp

Ground wood (at mill), $15 to $16
Ground wood, $22 to $24.50, delivered in United States
Sulphite (unbleached), $43 to $45, delivered in Canada
Sulphite (unbleached), $43 to $46, delivered in United States
Sulphite (bleached), $58 to $60, delivered in Canada
Sulphite (bleached), $58 to $62, delivered in United States

Paper Stock

No 1 hard shavings, $1.90
No. 1 soft white shavings, $1.72½
No. 1 Mixed shavings, 55c.
White blanks, 85c. to 87½c.
Ordinary ledger stock, $1.20
Heavy ledger stock, $1.40 to $1.50
No. 1 book stock, 72½c. to 75c.
No 2 book stock, 50c. to 55c.
No. 1 manilla envelope cuttings, $1.15
No. 1 print manillas, 65c. to 67½c.
Folded news, 55c.
Over issues, 57½c.
No. 1 clean mixed paper, 37½c to 40c.
Old white cotton, $2.50 to $2.75
Thirds and blues, $1.30 to $1.32½
No. 1 white shirt cuttings, $5.25 to 5.50
Blue overall cuttings, $3.50 to $3.62½c.
Black overall cuttings, $1.75
Black linings, $1.75
New light flannelettes, $4.60 to $4.75
Ordinary satinets, 75c.
Flock, 90c.
Tailor rags, 65c. to 67½c.

THE BRITISH MARKETS.

(Special to the Pulp and Paper Magazine.)

London, December 20th, 1913.

The present state of the paper industry in the United Kingdom does not show any improvement compared with my last report. Some of the mills are in a bad way for orders, particularly for newsprint, and of course, this state of affairs is bound sooner or later to materially affect the consumption of woodpulp. The exports of paper and millboard and playing cards, etc., only reached 269,854 cwt., compared with 337,466 cwt. in November, 1912, the figures for the eleven months being 3,039,901 cwt. in 1912 and 3,241,082 cwt. Paper mills in the North of England are complaining the most about the slackness of new business. There is a fair consumption of fine printings, writings, etc., in the large publishing houses where a fair amount of work given out by the government departments and municipal bodies (which entails a large consumption of paper), is being rushed. The bookbinders strike is still unsettled and the Irish consumption of paper lately has been very limited.

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The Income Tax Commissioners and their department are hearing some severe attacks made on them over the class of paper they introduce. "Londoner," writing in one of Lord Northcliff's papers says: "For one thing I should suggest a change of stationery. The Income Tax can not change his stationer, who is probably the Stationery Department. But I can assure my friend the tncome Tax, that under pressure, even the Staiionery Department can provide better stuff than this crumpled sheet of buff paper. . . ."

* * * *

The market conditions for sulphite and sulphate is continuing inactive and quotations are on a high level. Complaints are also heard here from Germany and Scandinavia of the inactivity of the pulp markets in those centres. Prices about are as follows, c.i.f. British ports:

Bleached Sulphite	$52.80 to $57.60
Easy Bleaching Sulphite 1st quality	40.80 to 47.00
Sulphite News	36.20 to 39.40
Unbleached Soda, 1st quality	39.40 to 40.20
Unbleached Soda, strong	36.00 to 39.40
Soda Kraft	38.40 to 39.40

* * * *

Buyers are adopting a waiting policy and very little new business is reported. There is also rumors that it is difficult to agree on a price for 1914. Prices are about as follows, c.i.f. British ports:

Pine 50% moist (prompt)	$9.96 to $11.00
Pine dry (prompt)	20.20 to 21.00

For forward delivery add another half dollar.

* * * *

The Esparto trade is experiencing pressure for temporary supplies of prompt shipments and prices have gone to a higher level. The rag, bagging, gunny and wastepaper trades are all busy and lately the run on stocks have been heavy.

* * * *

The chemical trade has been experiencing a dullness recently, but prices have changed very little, except for Bleaching Powder which is now quoted $26 to $27. Sizing is also unchanged and rosin is cheaper and quieter. The china clay trade keeps busy and the demand is good. During November 60,402 tons were exported as compared with 43,872 tons in November, 1912.

NEW YORK MARKETS.

(Special to the Pulp and Paper Magazine.

New York, N.Y., December 23rd, 1913.

Comparatively little new business has developed during the interval in either foreign or domestic sulphites. This is due partly to the concluding of business in all lines for the year 1913. Consumers of chemical pulps in all quarters are now preparing for the new year, and in consequence of the same old year-end quietness prevails, and the delivering of old orders, or the recording of small additional sales, chiefly in krafts and unbleached sulphites, to complete the year's needs provided about the only stir noticeable. Though prices have been rather easy during the past two months, they are now reporting a more steady tone, and it is the consensus of opinion among the leading distributors that after the turn of the year, trading on all sides will assume a larger and better volume. In summing up the year's business one of the leading local distributors stated this week that he feared his records for 1913 would be considerably below either 1912 or 1911.

This being the last week of the old year, it was but natural that the call for additional lots of ground wood pulp should be extremely light. The closing of the year has not entirely augmented this situation, however, for mills during the past several mouths have had a plentiful supply of pulp on hand, and, on account of the very good water conditions were enabled to grind considerable more pulp than needed. But, conditions are now changing. Many of the mills are suffering from anchor ice troubles, and in consequence only about 80 per cent. of the actual capacity of the grinders is being turned out. Values are fairly steady, and f.o.b. prices given herewith are a good criterion of the market situation.

The temporary sessation of operations among the mills generally during the week for stock taking and other purposes, has been quite noticeable in the local paper stock field. However, some few dealers report bookings of good sized orders to Western manufacturers for hard and soft white shavings, book and ledger stocks. Common papers are accumulating rapidly as consumers appear to have sufficient supplies in hand to cover requirements for sometime ahead. Nevertheless good packings of mixed are commanding a little attention at around 35c., while commons rule at 25c. per 100 pounds. Shavings are firm at 2c. to 2½c. for hard and 1¾c. to 2c. for soft. White news is selling at 1¼c., ledger at 1½c., solid ledger at 1¾c., and book stocks ¾c. to 1¼c.

Pulp.

Ground Wood, No. 1, $17 to $19 per ton, f.o.b. mill
Ground Wood, No. 2, $15 to $16 per ton, f.o.b. mill
Unbleached sulphite, domestic, 20.05c. to 2.20c. per lb., delivered.
Unbleached sulphite, imported, 1¾c. to 2c. ex dock, New York.
Bleached sulphite, domestic, 2.90c. to 3c. per lb., delivered.
Bleached sulphite, imported, 2.70c. to 2.95c. per lb., ex dock, New York.
Easy bleaching sulphite, imported, 2.10c. to 2.20c. per lb., ex dock, New York.
Unbleached sulphite, imported, 1.80c. to 2.10c. per lb. ex dock, New York.
Bleached sulphate, imported, 2.60c. to 2.80c. per lb., ex dock, New York.
Kraft pulp, imported, 1.85c. to 1.95c. per lb., ex dock, New York.
Soda pulp, domestic, 2.15c. to 2¼c. per lb., delivered
(All quotations of foreign products are made on a basis of ex duty.)

All trade activity in the New York market, has now given way to the quieting influences incident to the holiday season. Such business as developed during the past week represent chiefly orders that were placed for filling in purposes until the year closes. Because of the curtailed demand, dealers are busily engaged putting their affairs into shape to take stock and conclude the yearly balancing of their accounts. The jobbers say their customers only want such goods as will carry them over the remaining days of 1913, and can not be induced to buy over next year. Retail houses have been quite busy for the holidays, but this trade reached its height this week and quietness on all sides is now most pronounced. Though there are some optimists in the paper trade, it is a conceded fact that every one interested therein has greatly suffered under the general depression of business. Paper manufacturers in many quarters have either been forced to shut down completely or else greatly curtail operations. Of course, there are a few who are enjoying good business but the balance sheets of the majority will not be so glowing in 1913 as they were at the close of 1912. Retailers have bought cautiously all during the year. This in turn caused the jobbers to buy in a similar way, and in consequence the mills have not the volume of futures on their books that they have had in previous years. Notwithstanding all of this, prices in all lines have ruled very firm all during the year, and values today, with the bare exceptions of newsprint and tissues, are pretty much the same as they were on January 1st last. Newsprint has suffered considerably under the influences of competition incident to Treasury decision admitting other countries to the same priviliges extended to Canada under the reciprocity agreement, and also the new tariff matter. This has caused a slight depression in prices during the year, and values now are somewhat lower than they were when they year opened. The situation in tissues has been somewhat different and quotations are much firmer. Previous range of prices are without change and are repeated as follows:

News, rolls, transient business $1.95 to $2.00 f.o.b. mill.
News, sheet, $2.10 to $2.15 f.o.b. mill.
Book papers, car lots, C. & S.S., $4 to $4.20 f.o.h. mill.
Book papers, car lots, M.F.S., $3.75 to $3.90 f.o.b. mill.
Writing paper, superfine, 11c. to 13c. del. east of Miss. River.
Writing paper, extra fine, 10½c., del. east of Miss. River.
Writing paper, No. 1, fine, 9c., del. east of Miss. River.
Writing paper, No. 2, fine, 8c. del. east of Miss.Riv.
Writing paper, engine sized, 4½c. to 8c. del. east of Miss. River.

NORWAY AND SWEDEN.

Mr. C. E. Sontum, Trade Commissioner at Christiania, Norway, reports as follows, under date of Dec. 3, 1913.

The Norwegian Pulp Market.

In a report of November 3, it was stated that on account of the dry summer and fall, the water in the Norwegian rivers had become so low that several pulp mills had partly to close down for want of power. During the month of November, the weather has kept very mild and a good deal of rain has come, which will help out the mills in the lowland districts to a large extent. There is with them at present no shortage of water. In the inland districts, however, where there has been snow instead of rain, the rivers are still sinking, and the mills are most all being run with reduced power.

The Norwegian makers of mechanical wood pulp hoped that the prolonged drought would cause a restriction of output sufficient to give some firmness to their depressed market. When most mills were obliged last month to stand idle or work with greatly reduced power, the prices actually commenced to harden, but since the prospects for sufficient power during the winter have been improved, the market has again relapsed into the same dull and lifeless condition as previously.

Cellulose is inactive and the tone is not strong.

Imports into Norway of Russian pulp wood.

During 1912 there was in the neighborhood of 30,000 English cubic cords of pulp wood imported from St. Petersburg. During 1913 the same import is estimated at 35,000 such cords. This import the Norwegian mills so far have found paying on account of the lower prices at which the Russian raw material could be bought. However, the prices have lately been raised, so it is doubtful how long this import will be found to pay. The demand for a higher price by the Russian exporters is principally caused by the increase in the wages in the inland of Russia during late years. This increase has amounted to as much as 50 per cent.

From St. Petersburg three kinds of pulp wood are exported, viz., clean-barked spruce, half-barked spruce and clean-barked aspen wood, besides a comparatively small quantity of half-barked aspen wood. The prices during 1913 have been for clean-barked spruce from Rbl. (Russian rubles) 44,00–46.40 pr. Russian cord of 343 cubic feet, for half-barked spruce from Rbl. 40.00–44.00 and for clean-barked aspen from Rbl. 28.00–32.50.

Export of Paper from Norway.

The export of paper from Norway was in 1908 108,000 tons; in 1910, 138,000 tons; and in 1912, 150,000 tons, and thus is steadily increasing.

Swedish Mechanical Pulp.

As usual, the water conditions decide upon the tendency of the market for mechanical pulp, and the rains, which we have had during the last days, have in some degree stopped the rising tendency, but only to a very small extent. We have just been informed that one of the largest buyers is offering Kr. 23.00 ($8.88) clear net f.o.b., Baltic port without finding sellers at this price. As we have not yet been able to get this statement verified, we must give it with reservation.

Swedish Chemical Pulp.

We are informed from the United States that several speculating importers are strongly endeavoring to press the market by circulating the customary untrue rumors about large stocks at the mills in Scandinavia as well as in the docks at the import harbors. The Swedish Cellulose Union declared officially some time ago that the stocks at the mills were small and comparatively the same as at the same time last year, and an examination, which the agents of the steamship lines have made, has showed that the stocks in the docks at the import harbors are only about 6,000 to 7,000 tons, or about a week's normal import.

It is also stated that several speculating importers have occasionally given out cheap offers for small parcels with a view to make buyers still more nervous.

However, we have also got a look at a report from a very esteemed and reliable firm of agents at New York, which is stating that the United States paper mills have in many cases not filled their requirements for next year. This firm pronounces the opinion, that they have not filled more than about one-fourth of their requirements, and if the Scandinavian manufacturers of chemical pulp would only hold well together the market would soon be equally favorable as in 1912, as the United States paper mills will very soon be obliged to enter the market in earnest.

Paper and Wood-Pulp Industry of Sweden.

In the year 1911 12,776 workingmen were employed in the different mechanical and chemical pulp mills of Sweden. The power employed at the same time was 156,967 h.p. The paper and paste-board mills employed 12,482 working men and the power was 56,648 h.p. The 213,000 h.p. thus employed in these two industries stands as No. 1 of Swedish power employed in any industry and is principally obtained through water power.

The Swedish Pulp Prices.

The latest Swedish quotations for pulp are:—

Mechanical, moist, white	$ 8 67	to	$ 9 33
Mechanical, dry, white	19 73	to	20 80
Sulphite, prime, light bleached	40 00	to	40 80
Sulphite, prime, strong	36 00	to	36 80
Sulphate, light bleached, ordinary	36 00	to	37 33
Sulphate, strong	36 00	to	38 67

All per ton f.o.b. steamer Swedish ports.

AUSTRALIAN IMPORTS.

Aggregating the imports of paper of all kinds—including printing, wall and wrapping paper—paper boards, printed books, stationery and stationers' sundries, the extent and growth of the importations into the Commonwealth are reflected in the following figures:—

	1911 £	1912 £	1912 Increase £
Total imports	2,831,808	3,116,215	284,407

Eliminating the item of printed paper, which is dealt with under a special heading, the other lines of paper, boards, etc., imported from Canada in

Imports from Canada	1911 £	1912 £	+ Increase —Decrease £
Paper boards coated	5	.... —	5
Paper advertising	176	636+	460
Paper millboard, etc	971	545—	426
Paper wall	1,546	3,051+	1,505
Paper wrapping	206	.... —	206
Paper other free	8,201	2,068—	6,133
Paper n.e.i., boards, etc	.....	308+	308
Paper books, etc	297	22—	275

With the exception of wall paper, advertising matter and one line of boards, the 1911 values were not maintained by Canada in 1912, but as regards some items, there promises to be an improvement in the 1913 figures. The attention of interested Canadian manufacturers is directed the detailed schedules appended to this report, which gave particulars of Australian imports of paper from all countries during 1911 and 1912.

The Commonwealth Requirements of Printing Paper.

Second in value (coming next to agricultural machinery and implements) in Canadian exports to Australia is the item of paper, of which practically the whole is printer (news) paper. The total imports of printing paper into the Commonwealth in 1912 were valued at £906,431, which represented an increase of $180,016 over 1911 and also constituted record figures. The increase in the value of the imports from Canada was £45,970, but the total of £179,173 in 1912 compares with £189,791 in 1908, which demonstrates that despite increased production in the Dominion, other paper-producing countries, are obtaining a stronger hold on the Australian market. Taking Norway and Sweden, conjointly, their exports of printing paper to Australia increased from £120,444 in 1911 to £179,327 in 1912, representing a gain of £58,883 of which practically the whole was newspaper. Obviously, the total increase of imports is not attributable to newspaper—on reels and flat—as other printing paper, which Canada does not specialize in, is included in the same classification. Machine finished printing paper and highly finished (on one side) lithographic papers are responsible for much of the imports from the United Kingdom, and to a lesser extent from the continent and the United States. Printing paper is not made in Australia and is admitted duty free, hence competition from oversea is upon the same basis, but continental shippers may possibly obtain lower freight rates than Canadian exporters.

The trend of the trade in recent years is disclosed in the comparative statement appended, showing country of origin and values:—

Imports of Printing Paper	1910 £	1911 £	1912 £
United Kingdom	303,541	303,660	329,908
Canada	158,624	133,203	179,173
Austria-Hungary	8,320	5,335	8,059
Belgium	10,498	8,054	9,197
France	23	......	......
Germany	33,866	44,203	44,723
Netherlands	765	1,307	4,672
Norway	58,049	69,260	74,396
Spain	133	301	
Sweden	46,285	51,184	104,931
United States	111,038	106,611	151,115
Other foreign countries	54	77	141
India	......	236	
Straits Settlements	......	14	
New Zealand	......	......	113
Japan	......	......	3
Total	731,196	726,415	906,431

Australian Paper Mills.

In New South Wales (near Sydney) there are two paper mills now in operation, one making wrapping paper and the other making manilla and box board (including strawboard). A third mill is being established in New South Wales for the purpose of making paper boards of varied character from waste paper and imported wood pulp. In making strawboard (from local material) and other boards from waste paper. There are also two mills in Victoria making wrapping paper, and one of these has additional plant manufacturing cartridge and blotting papers. The present output of Australian mills is not large, but the industry is making steady progress. No statistical information is available respecting the value of the output and paper and board mills in the Commonwealth. In 1912, wood pulp to the limited value of £662 was imported from Europe.

G. T. Clarkson, assignee of the Northern Island Pulp Wood Company, Ltd., Port Arthur, is offering for sale all the assets of their company comprising 13,000 acres in the district of Thunder Bay, containing 125,000 cords of wood together with the rights to cut over about 70,000 acres more. The day of sale is called for Wednesday, 18th March.

British Trade News

(Special to the Pulp and Paper Magazine.)

London, December 15th, 1913.

Indian papers that have reached London, show that the prospects of paper-making are being talked about at Bombay and Ceylon. The question is asked by one newspaper: "Why is there not a flourishing pulp and paper-making industry in India?" It states that while thousands of tons of paper are imported into the country every year, the Indian forests abound in materials suitable for paper-making, although according to general opinion, the raw material is not available. Special investigations, however, have shown that this apprehension is unfounded. Mr. W. Raitt, F.C.S., of the Imperial Forest Research Institute and cellulose expert to the Indian Government, shows that pulp can be produced from Savannah grasses. In one of his recent reports he explains that unbleached pulp can be produced from these grasses in Indian paper mills for less than $48, or, in some instances, $53 per ton. Compared with the cost of pulp of European manufacture, this leaves a margin of estimated cost of from $10 to $14 available for manufacturers' profits and payment of freight to customers. Mr. Raitt's investigation of these grasses, therefore, amounts to a proof of the prospective economic value of large tracts of land hitherto considered unproductive and an addition to the paper and pulp making resources of the country of a supply of raw material, which, it is stated on a most considerable estimate, can not be less than several millions annually. The "Times of India," and the "Journal of the Society of Arts," in London, say these facts are worthy the attention of papermakers in the British Isles, particularly those who do a large trade with India.

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Mr. G. W. Osborn, who presided at the annual meeting of Wall Paper Manufacturers, Ltd., said the past year had been a very trying time for a manufacturing business of their kind. The tendency had been for nearly all their raw materials to advance in price, and the costs of fuel and manufacture had all been on the up grade. Where the article manufactured was a fancy one, such as wall-paper, many buyers had a tendency not to pay higher prices than had been their custom on previous occasions while they were anxious to obtain an equal, if not superior, effect in their decorations. In other words those who had been accustomed to buy a 60-cent paper, wanted a 60-cent paper again in a market where the cost of production was rising. They had either to put less into the article or the extra cost of raw material and manufacture had to come out of the profits. As to the prospects, there was some indication of a stirring in the building trade, which for two or three years had not been brisk. This was likely to have a good effect on wall paper.

* * * *

The Carron Grove Paper Company in its annual report for the year ended October 25, states that after maintaining the mill and machinery in horough efficiency, and writing of the charge for epreciation, the net profit for the twelve months reaches £18,330 and the balance brought forward is £4,173, making £22,503. The directors propose to carry to reserve £7,550 and to pay a dividend on the ordinary shares at the rate of 10% per annum. The Darwen Paper Mill Company, Ltd., report for the half-year, states that after allowing a sum amounting to £9,250 for interest and depreciation, there is a net profit of £1,255. The adverse balance in the profit and loss account is now reduced to £1,195. The directors also state that the newsprint trade still continues most unsatisfactory. This observation of the directors is a general summing up of the newsprint trade position not only in England, but in Germany and Scandinavia. There has been quite a lull in business and some of the Lancashire mills are feeling the dullness of trade just as much as those in the south of England. In Dublin, where the labor riots have occurred recently, the paper mills are closed for want of coal and raw materials. A large amount of mill-board and pulp-board is shipped from Canada to Dublin each year. The papermakers of Germany held a meeting recently and it was decided to limit the production of German paper mills in the months to come in order to put the output more on a level with the consumption and thus keep up prices.

* * * *

Speaking at the annual meeting of the Kellner-Partington Paper Pulp Company, Sir Edward Partington said he would deal with the item, "Investments and forest properties," which appeared in the balance-sheet at £1,142,982. It was, he said, a large sum in comparison with the capital of the company. For some years it had been the policy of the directors to secure control of the supplies of raw material the company required for manufacturing purposes. For the last three or four years they had been doing that on a large scale. The company was a large consumer of wood and the directors thought it advisable, as far as they could, to purchase the land on which the timber grew and to escape the possibility of an artificial inflation of the price. They could not expect to get the same profit from an investment in land as from an investment in manufactures, but, taking it together, the investment was a very good one. A shareholder then asked whether sufficient allowance had been made for depreciation of the forests in Norway and in Austria, and a reply was given that a careful calculation had been made, allowing on the one hand for depreciation in consequence of the cutting down of timber and for appreciation from the natural growths of forests during the twelve months.

* * * *

The imports of paper into the United Kingdom gives an idea of what the state of trade was in November. These imports which include paper on reels and paper not on reels, hangings, packings and wrappings, cardboard, etc., total:

	November, 1913	
	Cwts	Values
Imports: November......	977,186	£614,618
Eleven months..........	11,793,942	7,026,346
	November, 1912	
	Cwts.	Values
Imports: November......	1,014,105	£610,638
Eleven months..........	11,077,391	6,567,832

The export trade of the United Kingdom, which also includes writing and printing paper, mill-board, etc., was as follows in November:

	November, 1913 Cwts.	November, 1913 Values
Exports: November......	269,854	£291,834
Eleven months..........	3,241,082	3,391,004

	November, 1912 Cwts.	November, 1912 Values
Exports: November......	337,466	£331,283
Eleven months..........	3,039,901	3,260,795

It is quite evident that bad trade has not only been experienced on the continent, but in all paper producing countries in Europe including England.

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Turning to the imports of papermaking materials we find the following figures:

	Nov. 1913 tons	Nov. 1912 tons
Mechanical, wet.........	39,503	52,374
Mechanical, dry.........	503	1,535
Bleached chemical, dry...	1,830	2,952
Unbleached chemical, dry.	35,308	39,178
Chemical, wet...........	1,876	1,462

Total of mechanical pulp, 40,006 tons in November, 1913 and 512,989 tons for the eleven months ending November, compared with 453,077 tons ending November, 1912. Other pulp reaches 79,020 tons in November and 868,938 tons for the eleven months ending November, compared with 816,710 tons during the first eleven months in 1912.

TRENT VALLEY FOREST RESERVE

The Commission of Conservation is recommending that the 2,000 square miles of land in the Trent Canal watershed be set aside by either the Dominion or Provincial Governments as a forest reserve. Such a protective measure would under the peculiar circumstances, seem to be well advised, The water supply for the Trent Canal and Kawartha Lakes is obtained from the watershed mainly, and would be seriously impaired if the area in question were denuded of the remaining timber. Since the Dominion Government in 1905 obtained control of the water rights, much valuable work in damming up the back lakes has been done, with the result that the flow of water for power purposes north of Peterborough has enlarged most satisfactorily. The Dominion has spent over ten millions already on the Trent Canal, and by the time the extensions to Georgian Bay and Lake Ontario are completed it will have spent several millions more. And, further there are cogent reasons beyond the water-conservation interest to support the commission's recommendation. Half of the area is now unpatented, or in possession of the Crown. Only a tenth of the land can be farmed. and the farming at the best is so poor as to be quite unprofitable. Less than 700 acres of a million acres of forest is untouched virgin area. Under the provincial order-in-Council of 1905, conveying to the Dominion the water control, the right to buy land along the lakes and water courses at 50 cents an acre was granted the Dominion Government, but only two thousand acres were bought. It seems obvious that the best interests of the district, as well as the requirements of a wise conservation policy, would be served by making the areas in question a reserve for afforestation purposes.

INVESTIGATIONS ON THE PERCENTAGE OF TANNING SUBSTANCE IN SULPHITE WASTE LYE.

Formerly substances were employed for tanning whose effective constituent consisted of co-called tannic acids. Substances which have recently been used for tanning and which, considered chemically, contain sulfo-compounds are quite different from these, the latter being Neradol of the Badische Anilin- und Sodafabrik and the sulphite waste lye concentrated by evaporation.

Of 100 parts of the organic substance contained in the waste lye about 50 parts are taken up by the animal skin and retained. The percentage of lime in the waste lye is troublesome and various admixtures have been employed for removing the lime. The tanning action of the waste lye is, however, generally changed by these admixtures; alkalies are particularly harmful in this respect. On the contrary, by adding lactic acid the tanning action of the waste lye is distinctly increased; the quantity taken up by the animal skin is thereby increased from 50 to 60% calculated with reference to the organic substance contained in the waste lye.

Sulphite waste lye has already been largely used in tanning, and indeed concentrated sulphite waste lye is obtained from abroad, the cost being of course, increased by the duty.

OCEAN FALLS.

Debenture holders of the Ocean Falls Co. will fare much better than at first supposed. An amalgamation of the largest paper plants on the Pacific Coast with the company has been practically concluded. The companies interested are the Crown Paper Company of Portland, the Quatsino Sound Pulp Company, the Powell River Pulp and Paper Company, and the Ocean Falls Company. By the terms of the agreement the latter plant will be operated at once, and a $3,000,000 paper mill will be constructed. The capitalists behind the merger are Messrs. Fleishhacker Brothers and William Pierce Johnson, all of San Francisco. The latter is president of the National Bank of California, and Mr. Mortimer Fleishhacker is president of the Anglo-London and Paris National Bank of San Francisco. These gentlemen have agreed to guarantee fifty per cent. of the bonds of the Ocean Falls Company, as well as to spend the above-mentioned sum on development work on that property. In order to validate the agreement a meeting of the shareholders of the Ocean Falls Company will be called, but no dissension is anticipated. The negotiations on behalf of the debenture holders were carried on by Mr. J. Hamilton Benn.

THE MANUFACTURE OF DARK-COLORED PAPERS.

When making better kinds of dark-colored papers in many cases it is sufficient to take unbleached or half-bleached pulp instead of bleached pulp. One thereby saves not only the bleaching agent but also the dye requisite for giving the paper the required dark shade. Further, unbleached fibres have a greater affinity for dyes than bleached.

A very frequently required tint is e.g., a brownish Bordeaux; this is obtained best by employing unbleached soda cellulose and a combination of Bordeaux and brown.

Deep red tints and also deep green and olive tints which are now frequently required are likewise preferably made from unbleached pulp.

In most of these papers (paper covers of catalogues, passe-partout, covers of files, better kinds of wrapping paper, etc.) fastness to light is important. This is obtained by employing mineral colors, but against their employment is the fact that they readily render the paper flabby or limp when a certain limit is exceeded; also, it is not possible so to fix mineral colors that they do not come off when the paper is rubbed. Therefore it is preferable to employ so-called substantive aniline dyes which are put on the market under various names, such as diamin, diamin genuine dyes, etc., and are sufficiently fast. As these dyes are almost completely absorbed by the fibre, there is less reason to fear complaints owing to colored waste water.

By observing the above hints the manufacture of many papers can be made more rational.

The New Zealand Paper Mills Company, Ltd., suffered last spring by the inundation of the Mataura River, which caused considerable losses on materials and stock. The Mataura mill lost £3,250, and £1,200 are required to bring buildings and machinery in shape again. The profits after paying a half-yearly dividend of £4,200, will be used to cover the losses mentioned. No dividends were declared.

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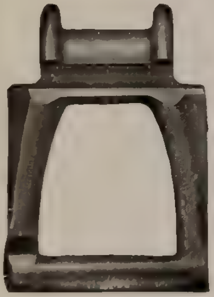

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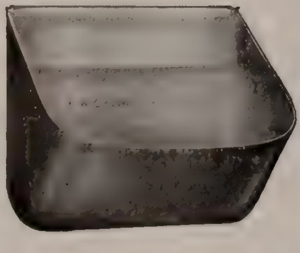

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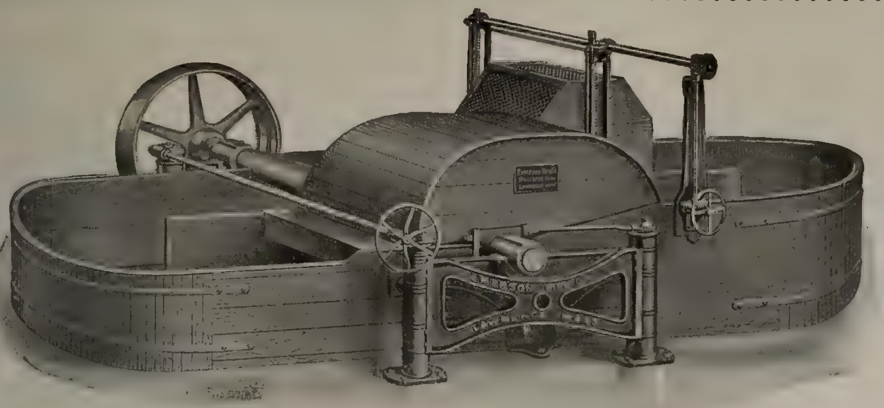

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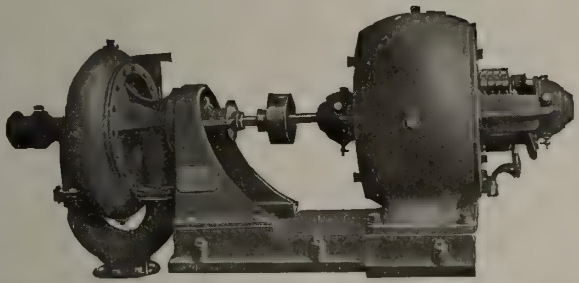

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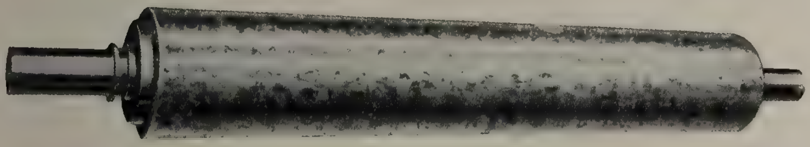

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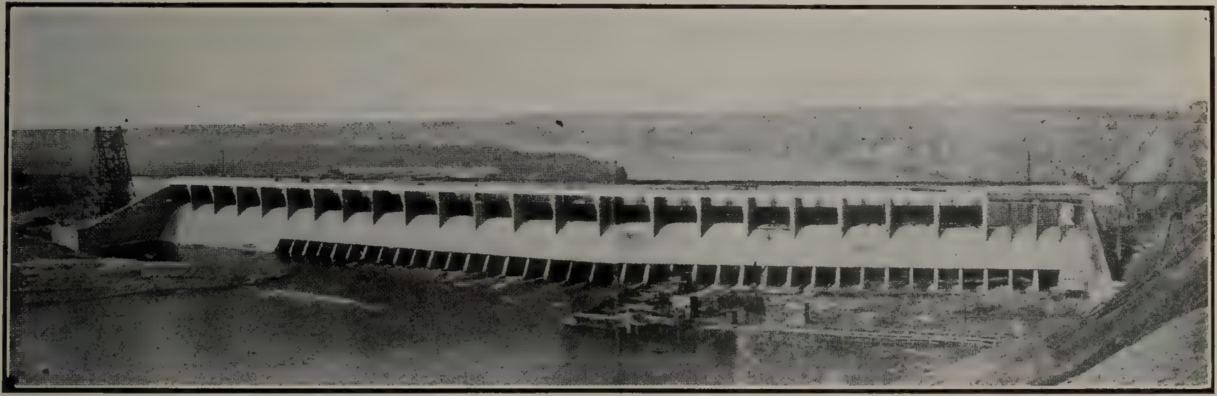

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McDougall, John, Caledonian Iron Works, Montreal, Can.
Smart-Turner Machine Co., Hamilton, Can.
Sherbrooke Mach. Co., Ltd , Sherbrooke, Que.
Voith, J. M., New York, N.Y.

Rags
Walker, J. R. & Co., Montreal, Can.

Recording Gauges
Schaeffer & Budenberg, Brooklyn, N.Y.

Recording Thermometers
Schaeffer & Budenberg, Brooklyn, N.Y

Refiners
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Marx, J. & Co., London, E.C., England.
Process Engineers, Ltd., Montreal, Canada.
Rice, Barton & Falls Mach. & Iron Co., Worcester, Mass.
Voith, J. M., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford, Can.

Rosin Size
Fox, Stockell & Co., London, Eng.
Paper Makers Chemical Co., Easton, Pa.
Process Engineers, Ltd., Montreal, Canada.
Vera Chemical Co., North Milwaukee, Wis.
Wilson-Paterson Co., Board of Trade Bldg., Montreal, Can.

Rosin Size Boilers and Dissolvers
Boving & Co., of Canada, Limited, Toronto, Ont.

Rotary Sulphur Furnaces
Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Pulp Mill Machinery Co., Montreal, Can.
Stebbins Engineering and Manufacturing Co., Watertown, N

Save-Alls
Boving & Co., of Canada, Limited, Toronto, Ont.
Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
Waterous Engine Works Co., Ltd., Brantford, Can.

Screen Plates
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.

Screens
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street. Toronto.
Glens Falls Mach. Wks., Glens Falls, N Y
Harmon Machine Co., Watertown, N.Y.
Jenckes Machine Co., Sherbrooke, Can.
Johnson, Chas., St. Henry, Que.
Marx & Co., J., London, England.
Process Engineers, Ltd., Montreal, Canada.
Sherbrooke Mach. Co. Ltd . Sherbrooke, Que
Tippet Arthur P. & Co., Montreal, Can.
Valley Iron Works, Appleton, Wis.
Voith, J. M., New York, N.Y.
Voith, J. M., Wurtemberg, Germany.
Waterous Engine Works Co. Ltd., Brantford, Can
Westbye, P. P., Peterboro, Can.

Slitters and Re-Winders
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Moore & White Co., Philadelphia, Pa.
Ticonderoga Machine Works, Ticonderoga, N.Y.

Smelting Furnaces
Boving & Co., of Canada, Limited, Toronto, Ont.

Straw Cutters'
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.

Straw Dusters
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.

Straw Digesters
Boving & Co., of Canada, Limited, Toronto, Ont.

Strawboard Making Machines
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.

Steam Regulator
Pickles, W. F., Buckland, Conn.

Stuff Chests
Boving & Co., of Canada, Limited, Toronto, Ont.

Sulphite Mill Equipment
Boving & Co., of Canada, Limited, Toronto, Ont.
Stebbins Engineering and Manufacturing Co., Watertown, N.Y

Sulphate Mill Equipment
Boving & Co., of Canada, Limited, Toronto, Ont.

Sulphur
Union Sulphur Co., 17 Battery Place, New York, N.Y.

Sulphur Burners
Boving & Co., of Canada, Limited, Toronto, Ont.
Glens Falls Machine Works, Glens Falls, N.Y.
Stebbins Engineering and Manufacturing Co. Watertown, N.Y.

Tachometers (Hand and Stationary)
Boving & Co., of Canada, Limited, Toronto, Ont.
Schaeffer & Budenberg, Brooklyn, N.Y.

Talc
Gillespie, Geo. H., Co., Madoc, Can.

Tanks
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Boving & Co., of Canada, Limited, Toronto, Ont.
Hamilton, Wm., Co., Peterboro, Can.
Jenckes Machine Co., Sherbrooke, Can.
McDougall, John, Caledonian Iron Works, Montreal, Can
Valley Iron Works, Appleton, Wis.

Thermometers
Schaeffer & Budenberg, Brooklyn, N.Y.

Transmission Machinery
Caldwell, H. W. & Son Co., Chicago, Ill.
Canadian Allis-Chalmers, Limited Toronto
Boving & Co., of Canada, Limited, Toronto
Jones & Glassco, Montreal, Can.
Dodge Manufacturing Co., Montreal, C

MILL SUPPLIES---Continued

Turbines
Boving & Co., of Canada, Toronto, Ont.
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Jenckes Machine Co., Ltd., Sherbrooke, Can.
Smith, S. Morgan Co., York, Pa.
Voith, J. M. Co., Inc. New York, N.Y.
Voith, J. M., Wurtemberg, Germany.

Water Wheels
Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Hamilton, Wm. Co., Ltd., Peterboro, Can.
Jenckes Machine Co., Sherbrooke, Can.
McDougall, John, Caledonian Iron Works, Montreal, Can.
Smith, S. Morgan Co., York, Pa.
Voith, J. M., New York, N.Y.

Wire Cloth for Paper Machines
Chambers, Ltd., Toronto.
Christie, Geo., Ltd., Glasgow, Scotland.
Johnson, C. H. & Sons, Ltd., St. Henry, Montreal, Que
Kufferath, Andreas, Mariaweiler, Germany.
Tippet, Arthur P. & Co., Montreal, Can.
Taylor, J. A., Montreal, Can.
United Wire Works, Ltd., Edinburgh, Scotland.
Westbye, P. P., Peterboro, Can.

Waste
Hough, R., London, England.

Wet Machines
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Glens Falls Machine Works, Glens Falls, N.Y.
Hamilton, Wm. Co., Peterboro, Can.
Jenckes Machine Co., Sherbrooke, Can.
Process Engineers, Ltd., Montreal, Canada.
Sherbrooke Machinery Co., Sherbrooke, Can.
Voith, J. M., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford Ont.

PULP AND PAPER MILL PRODUCTS

This aims to be a complete list of the products of Canadian Pulp and Paper Mills, who are urged to send us lists of brands and watermarks, as well as the headings under which they wish to be indexed. Buyers who cannot meet their requirements from this list, are invited to communicate with the editor, who is in close touch with the mills, and will gladly furnish full information.

PULP MILLS

Ground Wood Pulp

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
Basin Electric Light & Power Co., Ltd., Montmagny, Que.
Beaver Co. Ltd., Thorold, Ont.
Bego-Canadian Pulp & Paper Co., Shawinigan Falls, Que.
Brompton Pulp & Paper Co., Brompton and E. Angus, Que.
Booth, J. R. Ottawa, Ont.
Bronson Co., Ltd., Ottawa, Ont.
Clyde River Pulp & Paper Co., Ltd., Liverpool, N.S.
Colonial Wood Products Co., Ltd., Thorold, Ont.
Campbell Lumber Co., Weymouth, N.S.
Canada Paper Co., Ltd., Montreal, Que.
Chicoutimi Pulp Co., Chicoutimi, Que.
Compagnie de Pulpe de Dalmas, Dalmas, Que.
Davy, James, Thorold, Ont.
Eddy Co., The E. B., Ltd., Hull, Que.
East Canada Power & Pulp Co., Ltd., Nairn Falls, Que.
Foley-Rieger Pulp & Paper Co., Ltd., Thorold, Ont.
Ford, J. & Co., Port Neuf, Que.
Jacques-Cartier Pulp & Paper Co., Montreal.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
La Cie de Metabetchouan, St. Andre, Que.
La Havre Pulp Co., Ltd., Bridgewater, N.S.
Lake Megantic Pulp Co., Lake Megantic, Que.
Laurentide Co., Ltd., Grand Mere, Que.
MacLaren Co., Ltd., The James, Buckingham, Que.
McLeod Pulp Co., Ltd., Liverpool, N.S.
News Pulp & Paper Co., Ltd., St. Raymond, Que.
Nicolet Falls Pulp & Lumber Co., Nicolet Falls, Que.
North Shore Power, Railway & Navigation Co., Clarke City.
Northumberland Paper & Electric Co., Campbellford, Ont.
Nova Scotia Wood & Pulp Co., Ltd., Mill Village, N.S.
Ontario Paper Company, Thorold, Ont.
Ouiatchouan Falls Paper Co., Ouiatchouan Falls, Que.
Powell River Co., Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que.
Price-Porritt Pulp & Paper Co., Rimouski, Que.
Reed, A. E. & Co., (Nfld.), Ltd., Bishop's Falls, Nfld.
River-du-Loup Pulp Co., Ltd., Fraserville, Que.
Soucy, F. Florentine, Old Lake Road, Que.
Spanish River Pulp and Paper Mills, Ltd., Espanola, Ont., Sturgeon Falls, Ont., Toronto, Ont., and Sault Ste. Marie, Ont.
St. George Pulp and Paper Co., St. George, N.B.
Thorold Pulp Co., Ltd., Thorold, Ont.
Trent River Paper Co., Ltd., Frankford, Ont.
Union Bag & Paper Co., Cape Madeleine, Que.
Trent Valley Paper Mills, Glenmiller, Ont.
Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Q

Kraft

Brompton Pulp & Paper Co., East Angus, Que.
Dryden Timber and Power Co., Dryden, Ont.
New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
Quebec and St. Maurice Industrial Co., La Tuque, Que.
Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que

Soda Fibre

Canada Paper Co., Ltd., Montreal and Toronto.
Dominion Paper Co., Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.

Sulphite Fibre

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
Booth, J. R., Ottawa, Ont.
Dominion Pulp Co., Ltd., Chatham, N.B.
Edward Partington Pulp & Paper Co., Ltd., St. John, N.B.
Eddy Co., The E. B., Ltd., Hull, Que.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Lake Superior Paper Co., Ltd., Sault Ste. Marie, Ont.
Powell River Co., Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que.
Riordan Pulp & Paper Co., Ltd., Montreal, Que.
Spanish River Pulp and Paper Mills Ltd., Sturgeon Falls, Ont., and Sault Ste. Marie, Ont.
Swanson Bay Forests, Wood, Pulp & Lumber Mills, Ltd., Swanson, Bay, B.C.
Toronto Paper Mfg. Co., Ltd., Cornwall, Ont.

PAPER MILLS

Bag

Eddy, The E. B. Co., Ltd., Hull, P. Q.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
Ford, J. & Co., Port Neuf.
Wilson, Ltd., J. C., 61 St. Alexander Street, Montreal, Que.
Jonquiere Pulp Co., Jonquiere, Que.

Binders' Board

McArthur. Alex. & Co., Montreal.
Northumberland Paper and Electric Co., Campbellford, Ont.

Blotting

Canada Paper Co., Montreal, Que., "Velvet Blotting."

Board

See Wood Board and Cardboard Specials.

Bond

Canada Paper Co., Ltd., Montreal, Que. "Burmese Bond," "St. Lawrence Bond," "Canada Bond," "Burmese Linen Ledger," "Windsor Mills Special." "Silverstream," "Springvale," "Super Writing," "White Railway," "Railway Manilla,"
Howard Smith Paper Mills. Ltd., Montreal & Beauharnois, Que.
Kinleith Paper Co., Ltd., St. Catharines, Ont.
Rolland Paper Co., St. Jerome, Que., Mount Rolland, Que. and Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Book and Litho

Canada Paper Co., Ltd., Montreal, Que. "Art Photo Book," "Tinted Art Book," "Art Chromo," "English Book," "Satin Book," "Satin Litho," "Litho Label," "Super S. C. Book," "Standard S. C. Book," "Windsor Book."
Eddy Co., The E. B. ,Ltd., Hull, Que.
Kinleith Paper Co., Ltd., St. Catharines, Ont.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Box Board

See Wood Board and Cardboard Specials.

Dominion Timber Regulations

Licenses to cut timber on Dominion Lands in the Provinces of Manitoba, Saskatchewan, and Alberta, the Northwest Territories, within twenty miles on either side of the main line of the Canadian Pacific Railway in the Province of British Columbia, and in the tract of three and one-half million acres to be located by the Government of the Dominion in the Peace River district in the Province of British Columbia, lying east of the Rocky Mountains and adjoining the Province of Alberta, shall be disposed of by public auction at the office of the Dominion Timber Agent for the district in which the berths are situated.

Before any parcel of timber is offered for sale it shall be surveyed by a duly qualified Dominion Land Surveyor into berths of an area not exceeding twenty-five square miles, and each of such berths shall then be thoroughly cruised by a duly qualified timber cruiser in the employ of the Dominion Government. The Minister shall then fix an upset price at which the berth shall be disposed of, and no berth shall be sold at less than the price so fixed.

Purchases to the amount of one thousand dollars or under shall be paid in cash at the time of sale. Purchases over one thousand dollars and not exceeding five thousand dollars shall be paid, one-half in cash at the time of sale, and a note or notes shall be given for the remaining half of the purchase price, payable in three months, with interest at the rate of five per cent. per annum. Purchases over five thousand dollars and not exceeding ten thousand dollars shall be paid one-third in cash at the time of sale, and notes shall be given for the remaining two-thirds of the purchase price, payable in three and six months, with interest at the rate of five per cent. per annum. Purchases exceeding ten thousand dollars shall be paid one-fourth in cash at the time of sale, and notes shall be given for the remaining three-fourths of the purchase price, payable in three, six and nine months, with interest at the rate of five per cent. per annum. Notes shall be made payable at a bank in the city or town in which the sale is held or at a bank in the city of Ottawa. Cash payments must be made at the time of sale in legal tender or by an accepted cheque on a chartered bank, or by a draft issued by a chartered bank, payable to the order of the Deputy Minister of the Interior. If default is made in any payment required by this section the sale shall be forfeited and void.

The purchaser must also pay the cost or the estimated cost of the survey of the berth before a license is issued.

The licensee shall pay an annual ground rent of five dollars per square mile except for lands situated to the west of Yale, in the Province of British Columbia, in which case the yearly ground rent shall be five cents per acre.

The licensee shall pay the following dues on timber cut on his berth:—

Sawn lumber, 50 cents per thousand feet, board measure.

Railway ties, eight feet long, 1½ cents each.

Railway ties, nine feet long, 1¾ cents each.

Shingle bolts, 25 cents per cord.

And 5 per cent. on the sale of all other products of the berth.

Timber Permits

Yearly permits are granted to settlers, mine operators and others on application to the Dominion Timber Agents, from whom further information can be obtained.

W. W. Cory
Deputy Minister.

Department of the Interior, Ottawa,
December 20th, 1912.

PAPER MILLS---Continued

Bristol

Don Valley Paper Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.
Canada Paper Co., Montreal & Toronto, "King Bristol," "Windsor Bristol," "C. P. S.Tinted Bristol," "Canada Bristol."

Building and Sheathing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que.
British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
Eastern Paper Co., Ltd., St. Basile, Que.
Montreal Paper Co., St. Basil, Que.
Northumberland Paper and Electric Co., Ltd., Montreal.
Riordon Pulp and Paper Co., Ltd., Montreal, Que.
Western Paper Mills, Ltd., Vancouver, B.C.
Jonquiere Pulp Co. Ltd., Jonquiere, Que.
Ford, R. & Son, Port Neuf, Que.
Laurentide Co., Ltd., Grand Mere, Que.
McArthur, Alex. & Co., Montreal, Que.
McLeod Pulp Co., Ltd., Liverpool, N.S.
Walker, J. R. & Co., Montreal, Que.

Cardboard Specials

Hinde & Dauche Paper Co., Ltd., Toronto, Ont.
Jonquiere Pulp Co., Jonquiere, Que.
Macleod Pulp Co., Ltd., Liverpool, N.S.
Canada Paper Co., Windsor Mills, Que. "Victor Printers' Blanks," "Superior Translucent Bristol," " C.P.C. Coated Litho," "Superfine Litho Blanks."
Booth, J. R., Ottawa, Ont.
Eddy, E. B. Co., Ltd., Hull, Que.
Laurentide Co. Ltd., Canada Life Building, Montreal, Que.

Carpet Lining

Ford, J. & Co., Port Neuf Station, Que.
Montreal Paper Co., St. Basile, Que.
Northumberland Paper & Electric Co., Ltd., Campbellford. Ont,
Wentworth Paper Mills, West Flamboro, Ont.
Western Paper Mills, Ltd., Vancouver, B.C.

Coated

Ritchie & Ramsay, Toronto, Ont.
Georgetown Coating Mills, Ltd., Georgetown, Ont.
National Paper Co., Valleyfield, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.

Corrugated Paper

Lazier Paper Mills, Ltd., Belleville,
Hinde & Dauche Paper Co., Ltd., Toronto, Ont.

Cover

Canada Paper Co., Ltd., Montreal and Toronto, "Tinted Art Cover," "Derby Cover," "Fibrestoc Cover," "Cashmere Cover," "X Cover," "XX Cover."
Eddy Co., The E. B. Ltd., Hull, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Ritchie & Ramsay, Toronto, Ont.

Envelope

Don Valley Paper Co., Ltd., Toronto.
Kinleith Paper Co., Ltd, St. Catherines, Ont.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Felts

Bird, F. W. & Sons, Hamilton, Ont., and Pont Rouge, Que.
Eastern Paper Co., Ltd., St. Basile, Que
McArthur, A. & Co., Montreal, Que.
Ford, J. & Co., Port Neuf, Que.
Ford, R. & Son, Port Neuf Station, Que.
Montreal Paper Co., St. Basile, Que.
Northumberland Paper & Electric Co., Ltd., Campbellford.
Western Paper Mills, Ltd., Vancouver, B.C.

Fibre

Canada Paper Co., Ltd., Montreal and Toronto.
Dominion Paper Co., Montreal, Que.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
McArthur, Alex. & Co., Montreal, Que.
Riordon Pulp and Paper Co., Merritton, Ont.
Strathcona Paper Co., Strathcona, Ont.
Wilson, Ltd., J. C., Montreal, Que.

Flour Sacks

Eddy Co., The E. B., Ltd., Hull, Que.
Lincoln Paper Mills Co., Ltd., Merritton, Ont
Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal.

Glazed

Provincial Paper Mills Co., Ltd., Toronto, Ont.

Hanging

Lincoln Paper Mills Co., Ltd., Merritton, Ont.
McArthur, Alex. & Co., Montreal, Que.
Moira Paper Mills, Belleville, Ont.
Riordon Pulp and Paper Co., Ltd., Montreal, Que.
Strathcona Paper Co., Strathcona, Ont.

Kraft

Brompton Pulp & Paper Co. Ltd., East Angus, Que.
Dominion Paper Co. Ltd., Montreal, Que.
Dryden Timber and Power Co. Ltd., Dryden, Ont.
New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que.

Leather Friction Board

Walker, J. R. & Co., Montreal, Que.

News

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
Belgo-Canadian Pulp and Paper Co., Shawinigan Falls, Que.
Booth, J. R., Ottawa, Ont.
Canada Paper Co., Ltd., Montreal and Toronto, "Canada Brand."
Eddy Co., The E. B., Ltd., Hull, Que.
Ford, Joseph & Co., Port Neuf, Que.
Fort Frances Pulp & Paper Co., Ltd., Fort Frances, Ont.
Jonquiere Pulp Co., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Lake Superior Paper Co., Sault Ste. Marie, Ont.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
McArthur, Alex. & Co., Montreal, Que.
Miller Bros. Co., Ltd., Glenmiller, Oht.
News Pulp & Paper Co., Ltd., St. Raymond, Que.
Powell River Co. Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que.
Riordon Pulp and Paper Co., Ltd., Montreal, Que.
Spanish River Pulp & Paper Mills, Ltd., Toronto, Ont.
Ontario Paper Co., Thorold, Ont.

Roofing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que
Ford, Joseph & Co., Port Neuf, Que.
Ford, Rowland and Son, Port Neuf, Que.
Montreal Paper Co., St. Bazile, Que.
Walker, J. R. & Co., 35 Common, Montreal, Que.
Western Paper Mills, Ltd., Vancouver, B.C.

Straw Board

Ford, J. & Co., Port Neuf, Que.
Lazier Paper Mills, Ltd., Belleville.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
McArthur, A. & Co., Montreal, Que.
Moira Paper Mills, Belleville, Ont.
Northumberland Paper & Electric Co., Campbellford, Ont
Trent River Paper Co., Ltd., Frankford, Ont.
Trent Valley Paper Mills, Glenmiller, Ont.

Tag

Don Valley Paper Co., Ltd., Toronto, Ont.
Eddy, The E. B. Co., Ltd., Hull, Que.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
J. R. Booth, Ottawa, Ont.

Tissue and Toilet

Eddy Co., The E. B., Ltd., Hull, Que.
Garden City Paper Mills, Ltd., St. Catharines, Ont.
Interlake Tissue Mills, Ltd., Merritton, Ont.
Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Que

Wall Board

Beaver Co., Ltd., Beaverdale, Que.
Bishoprick Wallboard Co., Ottawa, Ont.

Wood Board

Beaver Co. Ltd., Thorold, Ont.
Booth, J. R. Ottawa.
Brompton Pulps Paper Co. Ltd., East Angus, Que.
Canada Paper Co., Montreal, Que.
Eddy Co., The E. B., Ltd., Hull, Que.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Northumberland Paper & Electric Co., Campbellford, Ont
McLeod Pulp Co., Liverpool, N.S.
Western Paper Mills, Ltd., Vancouver, B.C.
Wilson, J. C., Ltd., 61 St. Alexander St., Montreal Que.

Wrapping

Booth, J. R., Ottawa, Ont.
Canada Paper Co., Ltd., Montreal and Toronto, "Scotch Fibre," "Invictus Fibre," Hercules Manilla," "St. Fancis Manilla," "Wave Crest Drug."
Dominion Paper Co., Montreal, Que.
Don Valley Paper Co., Ltd., Toronto, Ont.
Eddy Co., The E. B., Ltd., Hull, Que.
Ford, J. & Co., Port Neuf, Que.
Ford, Rowland, Port Neuf, Que.
Gore Valley Paper Mills, Dundas, Ont.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Canada Paper Co., Monreal and Toronto.
See also Kraft.

Writing

Howard Smith Paper Mills Ltd., Beauharnois, Que.
Kinleith Paper Co., St. Catherines, Ont.
Rolland Paper Co., Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Manufacturing Co., Cornwall, Ont.

THE PROVINCE OF ONTARIO

is rich in timber, mineral, agricultural, and other resources.

Ontario has large areas of White Pine and other valuable timbers, her timber products last year representing one-third of the total output of Canada.

Ontario has pulpwood areas practically illimitable, and offers a great field for those desirous of embarking in the pulp and paper-making industry.

Ontario has innumerable waterfalls capable of supplying power for all manufacturing purposes, which are obtainable on reasonable terms, subject to development.

Ontario has large pulp and paper mills in operation at Ottawa, Sturgeon Falls, Spanish River Sault Ste. Marie and Dryden and large plants are under construction at Abitibi on the Temiskaming and Northern Ontario Railway, and Fort Frances on the Rainy River.

Ontario is traversed East and West by three great transcontinental railways, and North and South by three others.

For full particulars as to Ontario's great resources and the advantages offered for large wood-using industries apply to

Hon. W. H. Hearst

Minister of Lands, Forests and Mines

Toronto

Paper Mill Agents and Commission Merchants

Calgary, Alta.

Davis, W. D. & Co., 3rd Street, W., and 7th Avenue.
John Martin Paper Co., Ltd.
Tees & Persse.

Edmonton, Alta.

Tees & Persse.
John Martin Paper Co., Ltd.

Saskatoon, Alta.

Tees & Persse.

Vancouver, B.C.

Brake, Creedon Co., Ltd.
Mitchell Bros., 123 Cordova E.
Smith, Davidson & Wright.

Victoria, B.C.

Mitchell Bros., 8 Bastion.

Moose Jaw, Sask.

Tees & Persse.

Regina, Sask.

Tees & Persse.

Winnipeg, Man.

Barber & Ellis
Clark Bros. & Co., Ltd., 143 Portage.
Ratcliffe Paper Co., Ltd.
Hudson Paper Co.
Kilgour Bros.
Martin, John, Paper Co., Ltd., 319 William.
McAllister & Watts.
McFarlane, Son & Hodgson, Bannatyne and Adelaide.
Tees & Persse.
John Martin Paper Co., Ltd.

St. John, N.B.

Schofield Paper Co., Ltd., 26-30 Prince William.

Moncton, N.B.

Reid, F. P. & Co.

Halifax, N.S.

Eastern Supply & Paper Co., 28 Bedford Row.
Latter, N., 104½ Windsor.
Allen, T. C. & Co.

New Glasgow, N.S.

McGregor, R. & Co.

Kingston, Ont.

Hendry, J. A., 875 Princess.

Hamilton, Ont.

Buntin, Gillies & Co., Ltd., John and Jackson.
Powis, A., 64 King E.

Ottawa, Ont.

Barnard, W. R., 228 Albert.
Reid, C. De Wolf.

Port Arthur, Ont.

Tees & Persse.

Toronto, Ont.

Barber-Ellis Co., Ltd., 71 Wellington Street, W.
Brown Bros., Ltd., 51 Wellington Street, W.
Buntin, Reid Co., 13 Colborne.
Canada Paper Co., Ltd., 112 Bay Street.
Ratcliffe Paper Co., Ltd.
Fisher, E. W., 215 Victoria.
Gaine, T. & Son, 124 Richmond W.
Gage, W. J. Co., Ltd., 84 Spadina Ave.
Hodge-Sheriff Paper Co., McKinnon Building.
Howell, G. A. Co., 10 Wellington E.
Livingstone, H. E. & Co., 80 George.
McNairn, J. H., 5 Jarvis.
Thorne, A. M. & Co., 45 Colborne Street
Victoria Paper & Twine Co., Ltd., 415 King W.
Waters Bros., 33 Front E.
Whyte, Alex., 64 Wellington Street, W.
Wilkinson, E. H., Telephone Building.

Montreal, Que.

Dawson, W. V. & Co., 17 De Bresoles.
Dickinson, John & Co., Ltd., 216 Lemoine.
Little, T. B. & Co., 23 Cote.
Lloyd, Ed., Ltd., Eastern Townships Bank Building.
McFarlane, Son & Hodgson, 14 St. Alexander.
Reid, C. DeWolf, Herald Bldg.
Robertson & Parker, St. Paul.
Rolland, J. B. & Son, 14 St. Vincent.
Smith, Howard, Paper Mills, Ltd., 138 McGill.

Quebec, Que.

Andrews, F. H. & Son, 64 St. Paul.
Rolland, J. B. & Son, 36 St. Paul.

Foreign

Salomon & Co., Felix, New York City.
Whitaker Paper Co., Cincinnati, Ohio.
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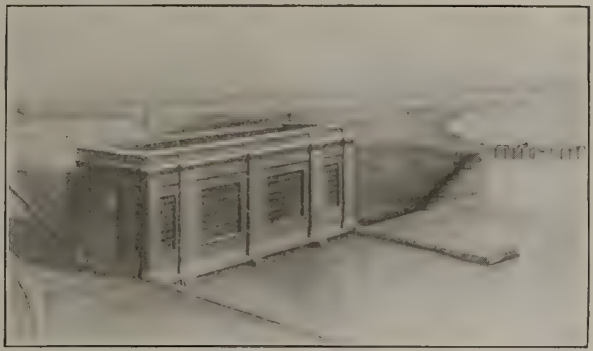

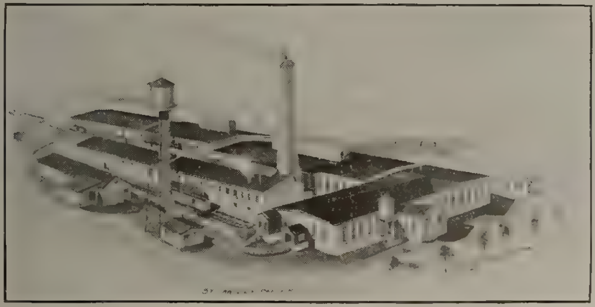

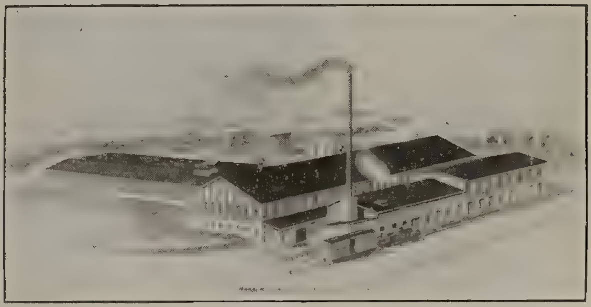

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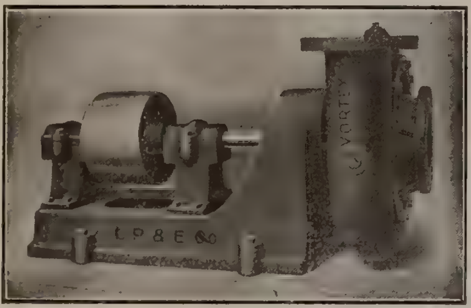

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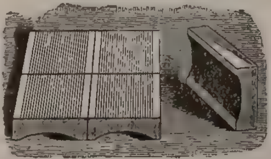

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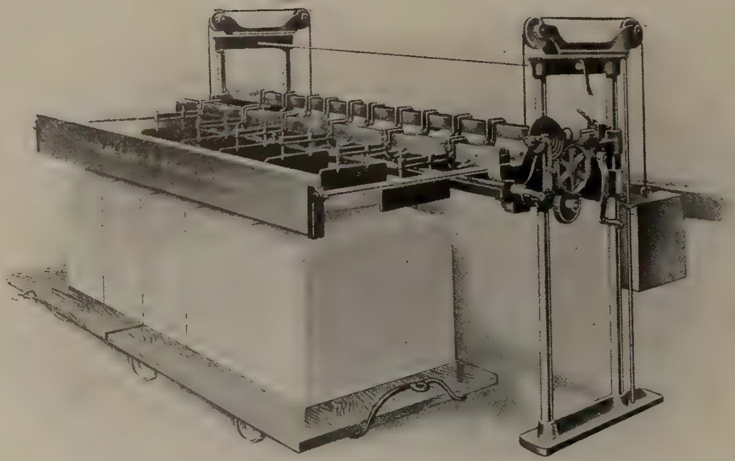

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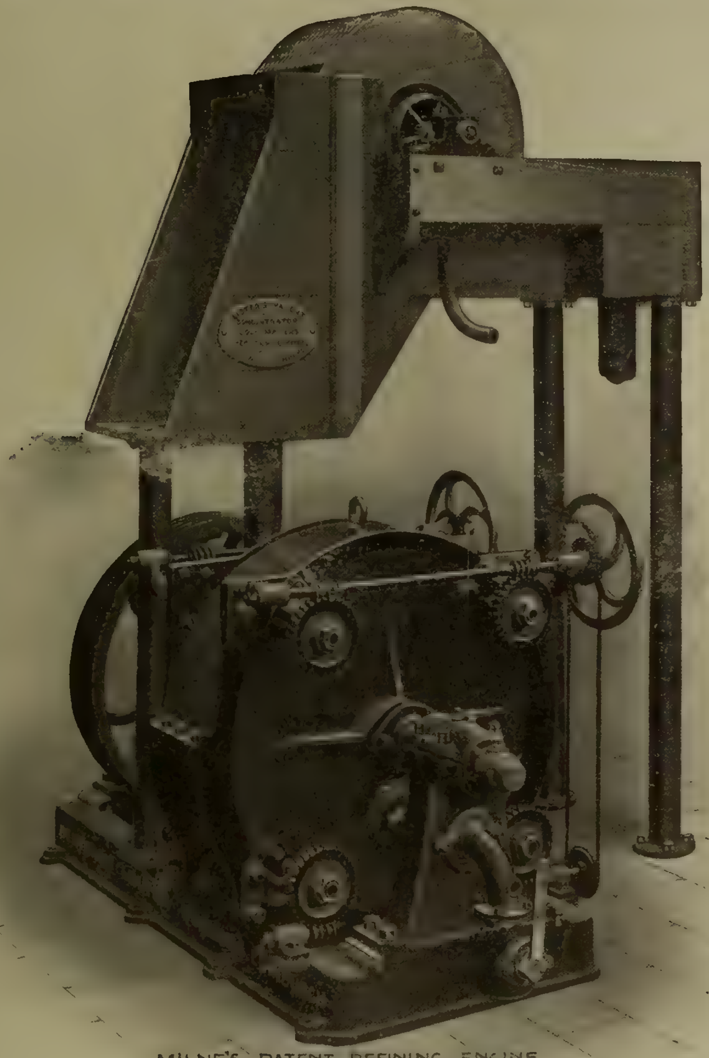

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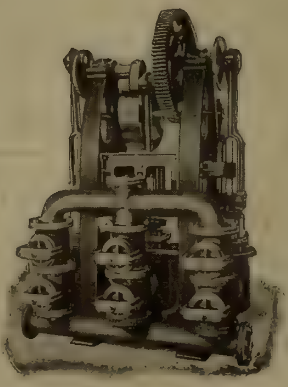

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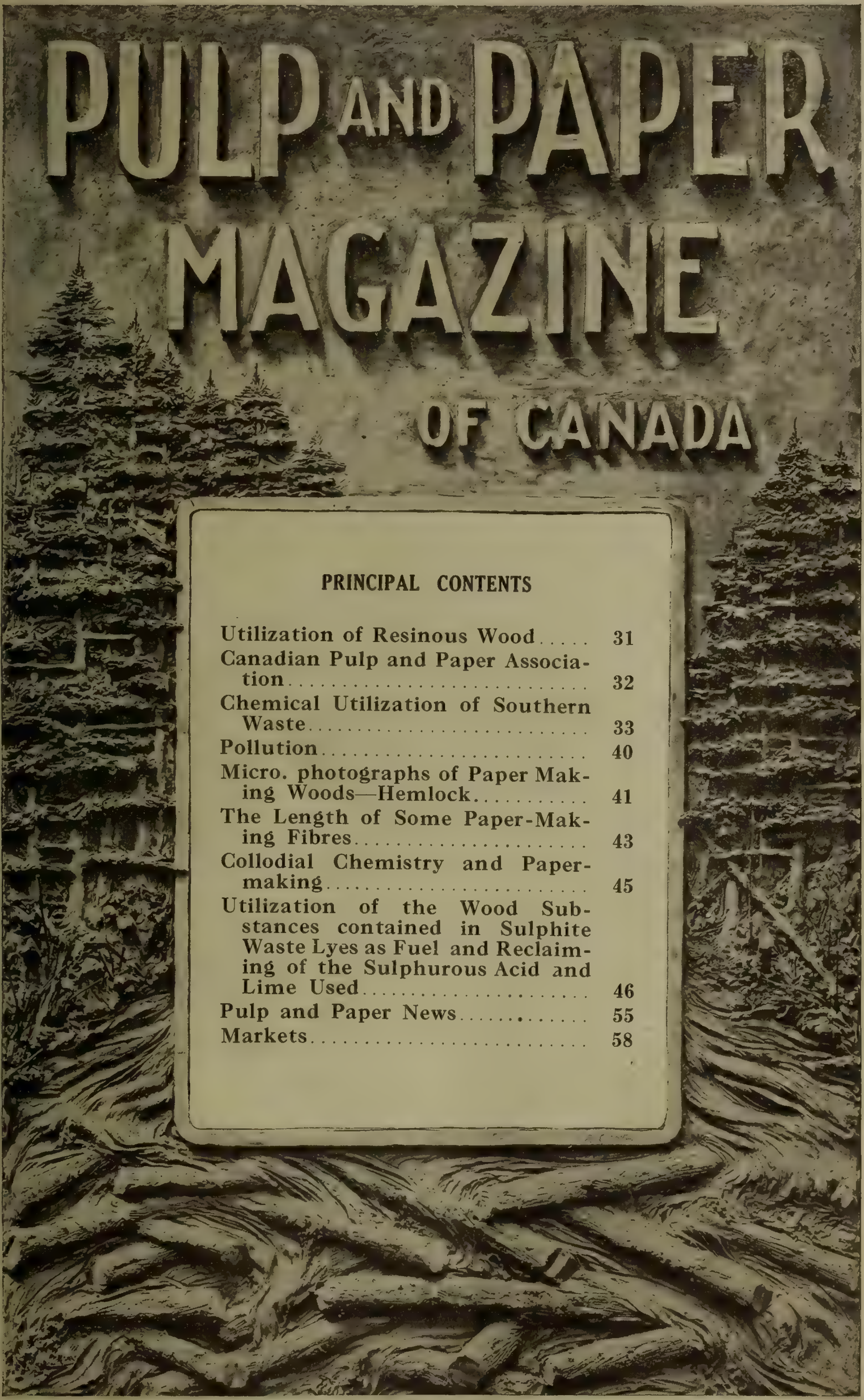

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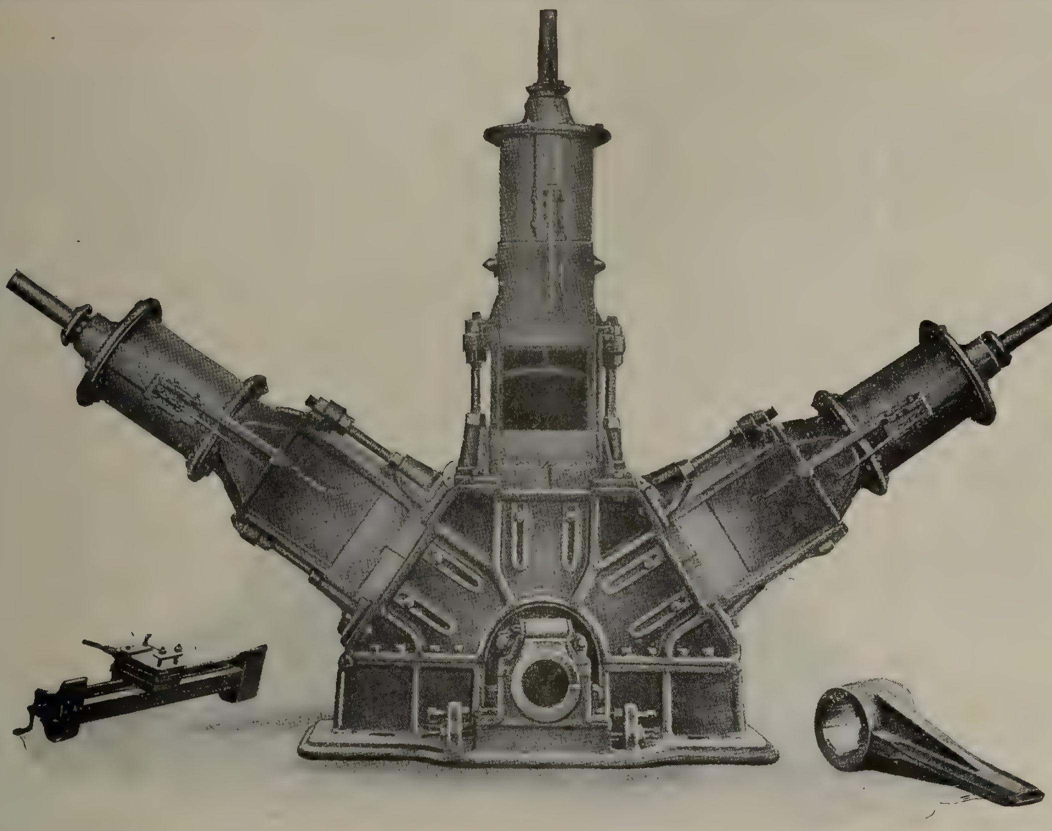

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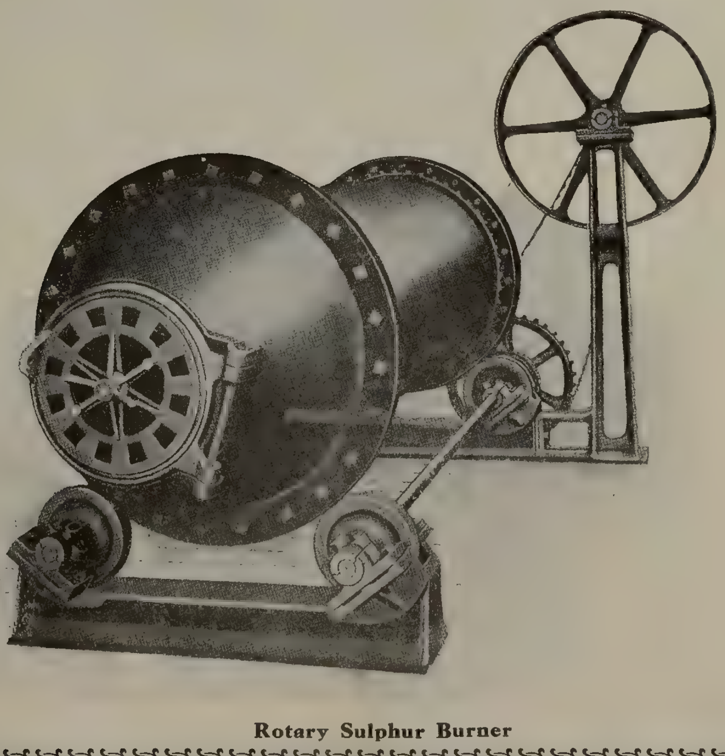

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Interior of the MACHINE ROOM of MESSRS. EDWARD LLOYD, LTD., SITTINGBOURNE, ENGLAND, containing the last two machines supplied to this Company by Chas Walmsley & Co., Ltd.

CHARLES WALMSLEY & Co Ltd BURY ENGLAND
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These "Walmsley" Fast News Machines are 175 inches wide, and are making paper at OVER 600 FEET PER MINUTE, with an OUTPUT OF 500 TONS NEWS PRINT WEEKLY. The machines are equipped with the Lloyd and Hutchison Patent Drive. This patent device is controlled by Walmsley & Co., Ltd., and dispenses entirely with Friction Clutches and Gear Wheels.

Charles Walmsley & Co. Ltd.

PAPER MAKERS' ENGINEERS

BURY - England

Head Offices,
ATLAS WORKS
Branch,
WOOD STREET

Codes, WESTERN UNION, A.B.C. 5TH EDITION,
McNEILL'S 1908

Telegrams, "PUMPS, BURY."
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SPECIALTIES—

- **Complete Paper Mill Plants**
- **Variable Speed Enclosed Steam Engines**
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- **Super Calenders**
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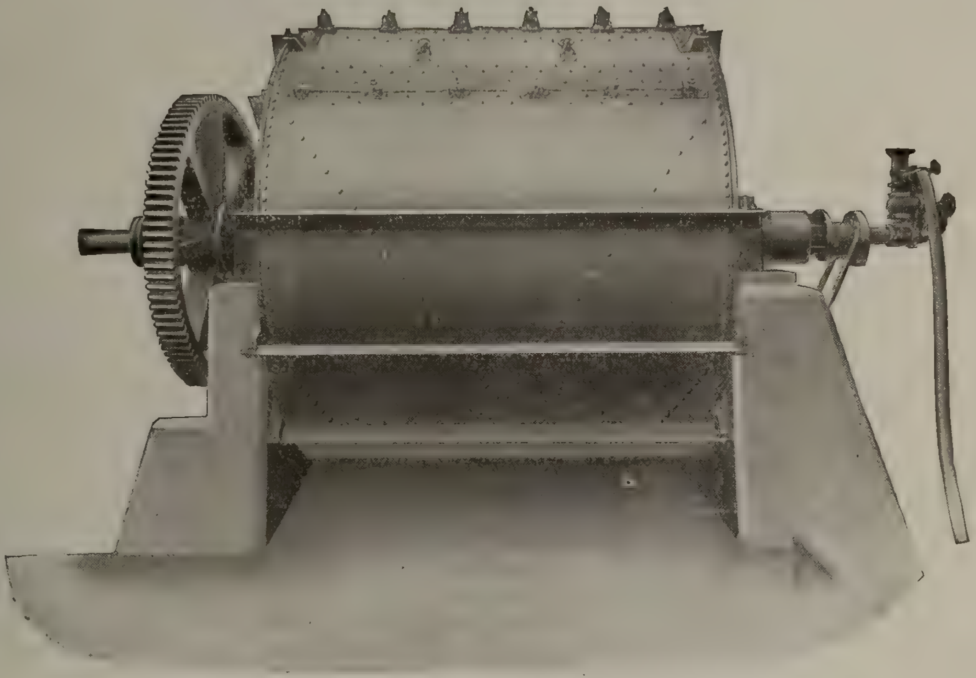
ST. HENRY, MONTREAL

This Barking Drum affords the means of an immense saving in barking wood for pulp mill process



The BACH-WIIG Barking Drum

In this machine the bark is removed by the action of friction and water, therefore there is absolutely no loss of wood, shrinkage in cubic measurement being confined entirely to the percentage of bark. Tests made against the knife barker have shown the following results:

The Loss with the Barking Drum	
Round wood covered with bark	8%
Slabs	23.8%
Edgings	9.4%

Loss with Knife Barker	
Round wood covered with bark	22 to 24%
Slabs	50%

Loss with edgings on knife barker not given as it is well known they cannot be handled practically on knife barker, so really the savings on edgings is their comparative value for fire wood or for pulp wood

Any of our offices will be glad to furnish further information if requested

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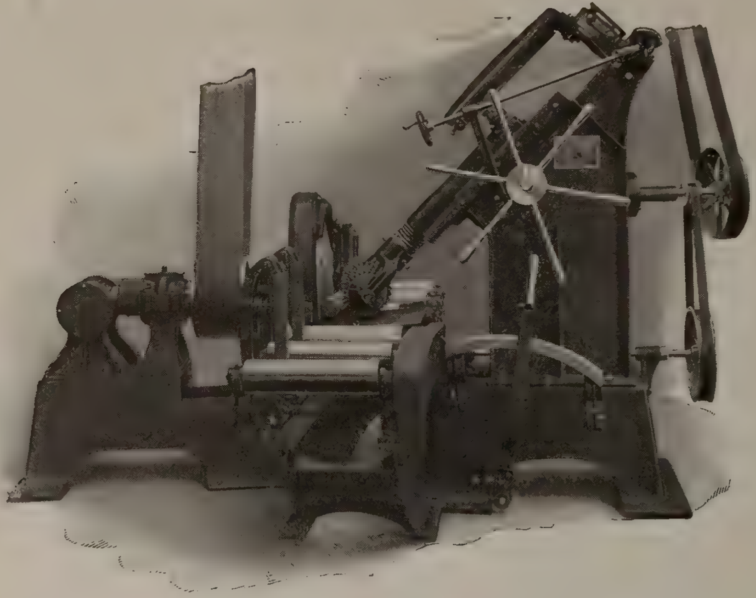
General Offices, SHERBROOKE, QUE.
Factories, Sherbrooke, Que. - St. Catharines, Ont.

Sales Offices, Sherbrooke, Montreal, St. Catharines,
Cobalt, South Porcupine, Toronto, Vancouver, Nelson, B.C.



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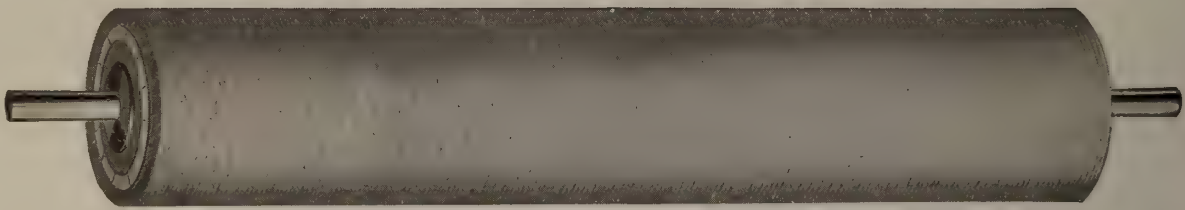

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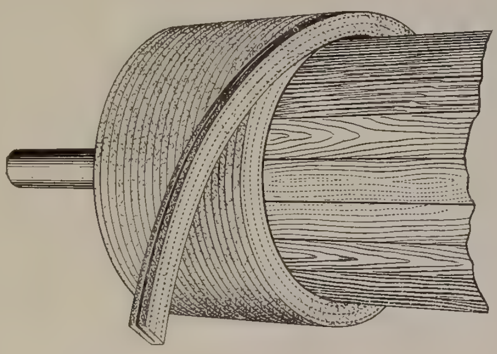
THEY KEEP ELASTIC
THEY ARE RIGHT IN PRINCIPLE AND MAKE GOOD IN PRACTICE



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Always in perfect condition.
Increases production of machine.
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Superior to rubber rolls.
Especially valuable on board machines.
Old rolls can be wound in this manner.

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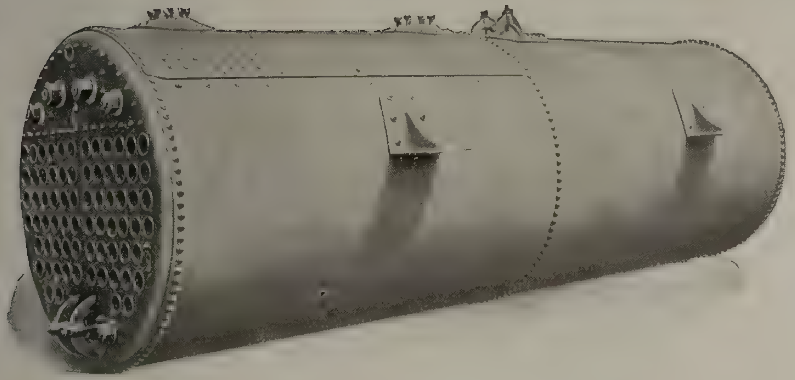

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WATEROUS BOILERS are built in all sizes up to 72 in. x 18 ft. We can supply them in most sizes at once from stock; if not we can turn out your order in quick time.

Our service is prompt, our workmanship the very best, our prices reasonable.

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but a smooth, noiseless, non-vibrating, easy running driving arrangement is our

New Paper Machine Drive

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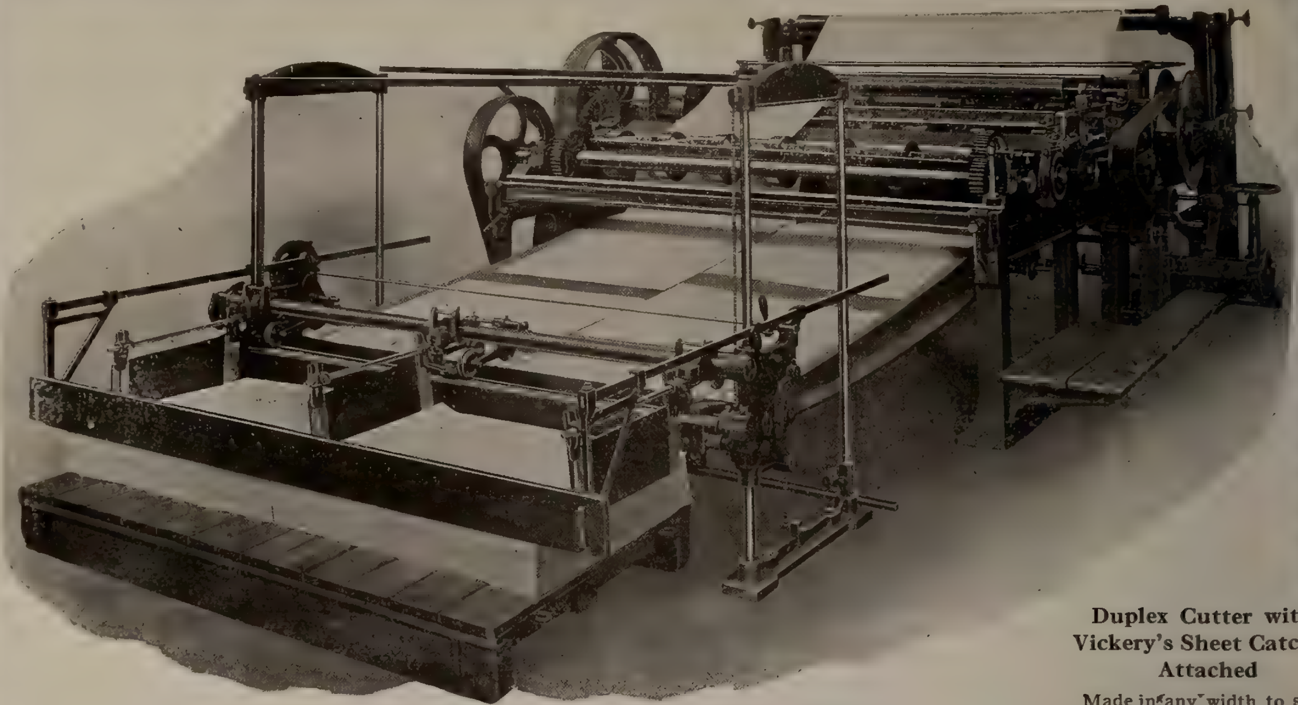

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Made in any width to suit requirements

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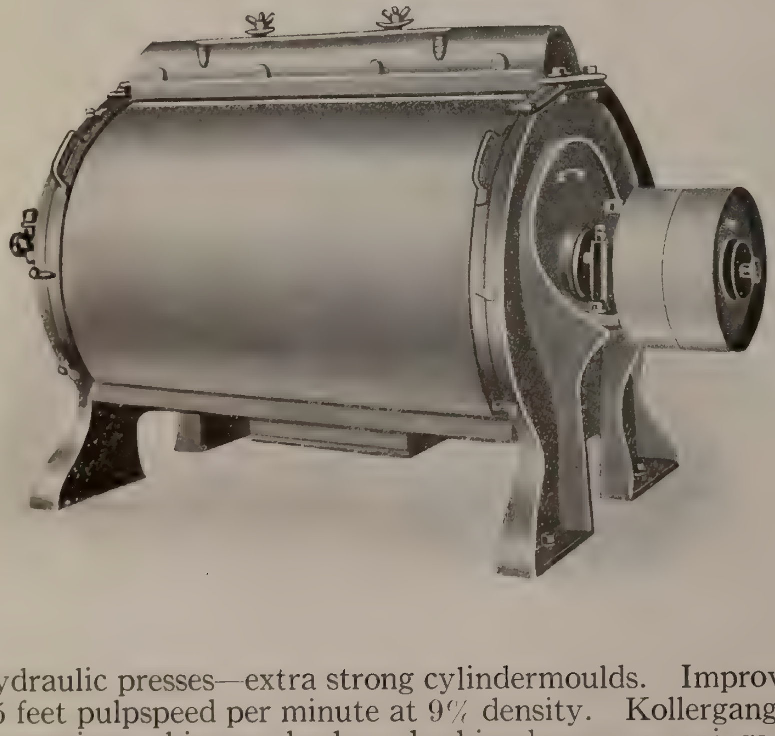

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Hydraulic presses—extra strong cylindermoulds. Improved powersaving beating engines with 55 feet pulpspeed per minute at 9% density. Kollergangs for pulping sulphite and sulphate screenings, chippers, barkers, barkingdrums, screenings, refiners.

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It takes experience and imagination to look beyond the price of the belt and estimate its length of service. Not until you can do that will you get your money's worth in buying belting.

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Now if you will do that when you consider "Dick's Original Balata Belting" you will begin to realize what a cheap, economical belt it is. There is absolutely no belt on the market that can come anywhere near giving such unusual service.

In the first place, R. & J. Dick Limited of Glasgow, Scotland, were the originators of Balata Belting, and for that very reason naturally know how to make the best. It always pays to buy from men who originate things rather than from the imitators.

This Trade Mark, stamped on each Belt every few feet, is your protection.

"Dick's Original Balata Belt" is specially distinguished for great strength and durability; perfect uniformity; absence of stretch and shrinkage; strong gripping power, ensuring the transmission, practically without loss, of the whole power given off by the engine; and complete immunity to water and steam.

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The man who knows all about Amber Size is the man who uses it. He tells of Low Sizing Costs, entire absence of Trouble and an absolute Reliability that is undreamt of by the users of other Sizes.

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Manufacturers of Woolen Felts and Jackets for all kinds of Paper and Pulp.
Strong open Gray Felts for high speed news machines and Gray Pulp Felts for Ground Wood and Sulphite.
Lowest cost per ton of product. Very heavy Jackets for long rolls of large diameter.

The Proof of a Pudding is in the Eating!

READ THIS AND NOTE THE DATES

Messrs. JONES & GLASSCO,
Montreal, Que.

————, Ont., *July 6th, 1909.*

Gentlemen:—Answering your letter of the 2nd instant, it affords us pleasure to state that we have had two of the Renold Chain Drives in operation in our paper mill for about two years. These Drives have been used in connection with two beaters and are transmitting about 75 horse power each from a motor. During the period named we have had no trouble whatever with the drives and can only say that they have been all that was claimed for them at the time they were purchased.

Yours truly, ————x.

x—Name on application

This same Company have since made large extensions and we have executed the following repeat orders for them :

March, 1910, Two-60 H.P. Drives
January, 1911, One-60 H.P. Drive
September, 1911, Two 60 H.P. Drives
June, 1912, Two-60 H.P. Drives

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Sole Canadian Agents
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Renold Patent Silent Chains

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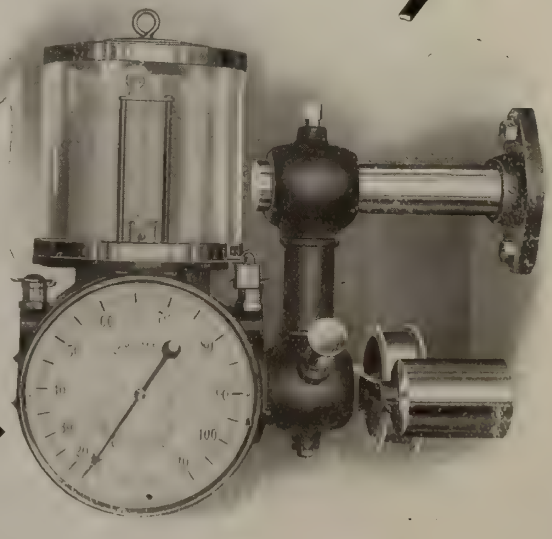
Is Made Possible by the Installation of "Columbia" Paper Machine Tachometers

For with the "Columbia" installed, you are furnished each morning with a mechanically written record showing the exact paper speed maintained by the paper machine for every single minute, the day and night before. If there were any variations, if anything went wrong, it is clearly shown. If there was a break, the chart shows it and tells just how much time was wasted. When the chart has told its daily story, it goes into a file for future reference and comparison. The indicating dial of the "Columbia" enables your men to see at a glance whether the machines are running at the right speed. All this tends to a bigger and better output.



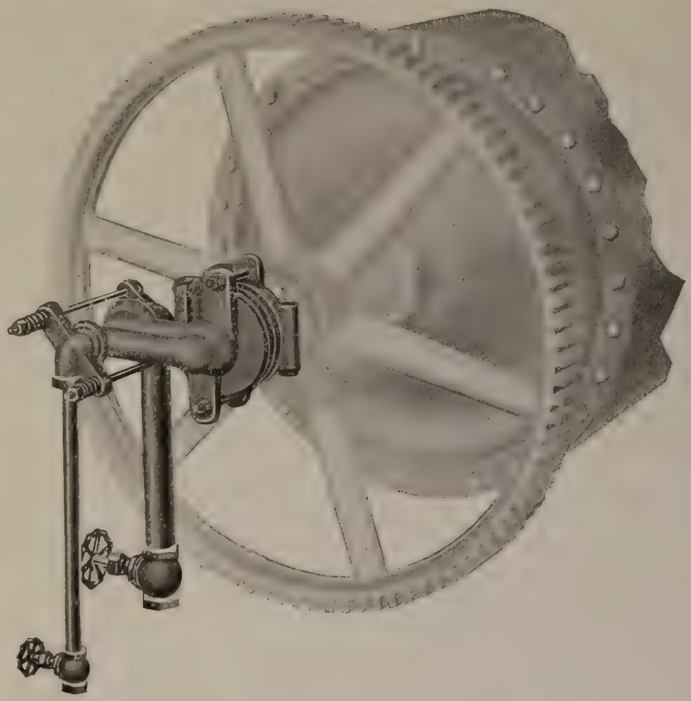
The "Log" of the Paper Machine

Learn more about the "Columbia" and our 30 days' trial offer. Ask for bulletin 623 today.

The Schaeffer & Budenberg Mfg. Co.

Makers of "Columbia" Recording
Gauges and Thermometers, etc.

Chicago BROOKLYN, N.Y. Pittsburgh



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Patent Adjustable Steam Joint ∴ and Duplex Safety Valve ∴

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No packing required—all metal joints

Self adjustable. Takes care of expansion and contraction, also irregularity of piping. A positive safety valve; pressure in dryers cannot exceed a determined amount

Over 1500 sold in the past three years

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LEADING BUILDERS OF PAPER MILL MACHINERY SINCE 1856

Triplex Stuff Pumps

Specially designed for handling paper stock and thick or heavy liquids, either hot or cold.

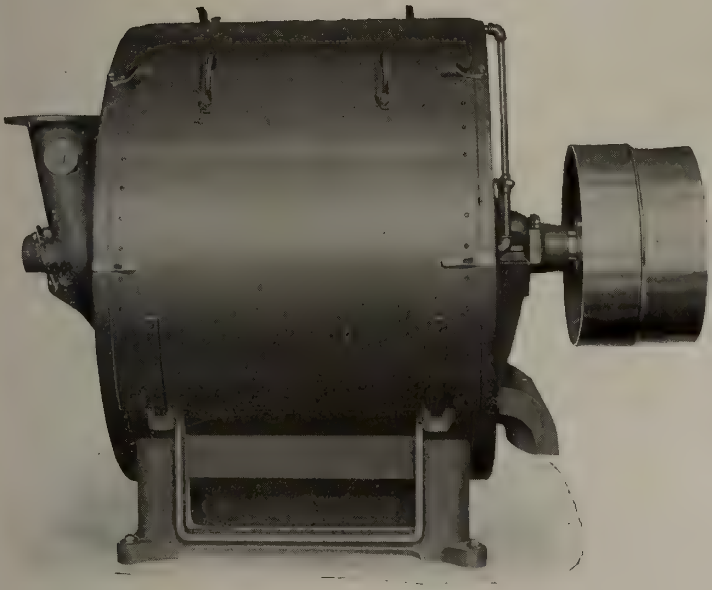
They are built for a maximum pressure of 75 pounds, and have been designed solely to meet the above requirements.

The plungers are of phosphor bronze, accurately machined and ground true and smooth. The valves are bronze balls and the valve seats are of bronze.

They are high-grade pumps, strong, heavy and substantial, made in the most careful manner and are fully guaranteed.

They are illustrated and fully described in our pump bulletin, which we will send you upon request.

WILLIAM HAMILTON COMPANY,
Limited
Peterborough - - Ontario



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Horizontal and Vertical Design.
—FOR—
Mechanical and Chemical Pulp
15 of these Machines have been sold within the last few months
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We have designed and manufactured many important installations throughout Canada.

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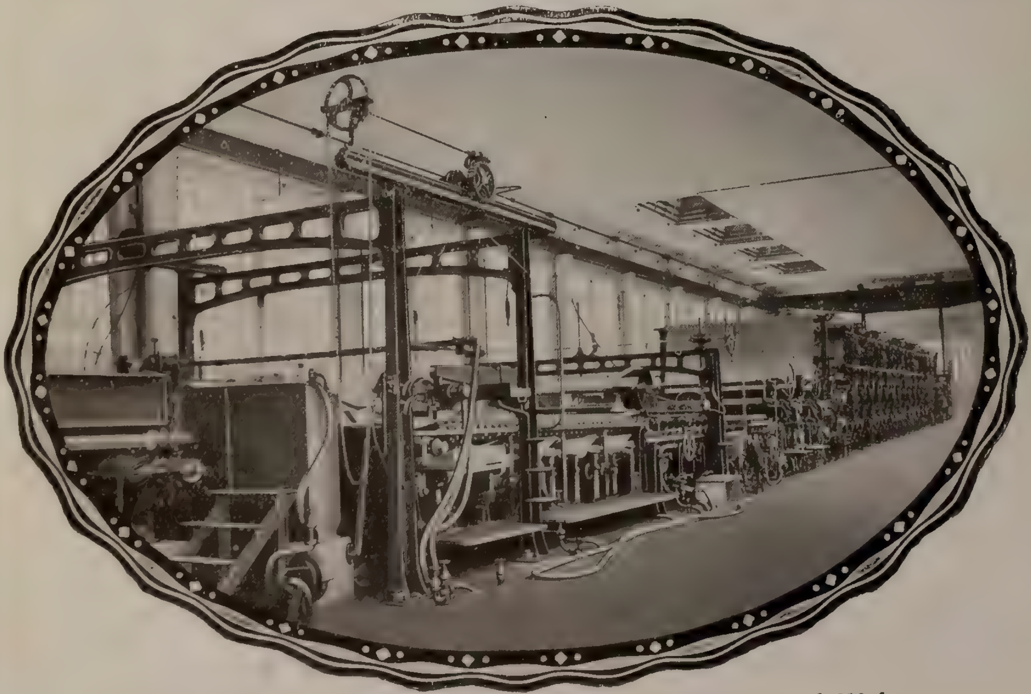

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MACHINE: Output, 55 tons News Speed 610 ft.

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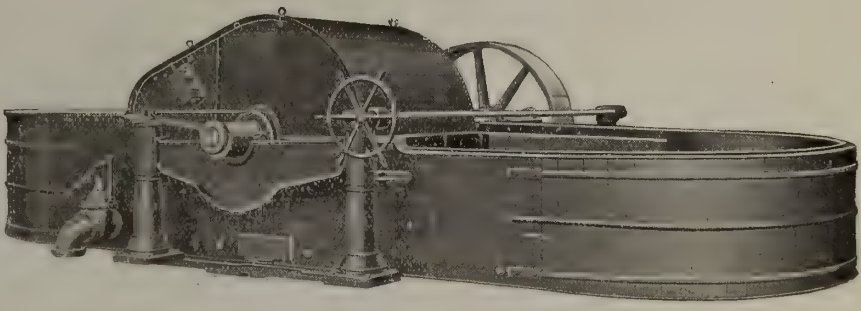

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Patented Wooden Sectional Suction Box Covers. Warner's Patent Metal Sand Catcher for Beating and Washing Engines

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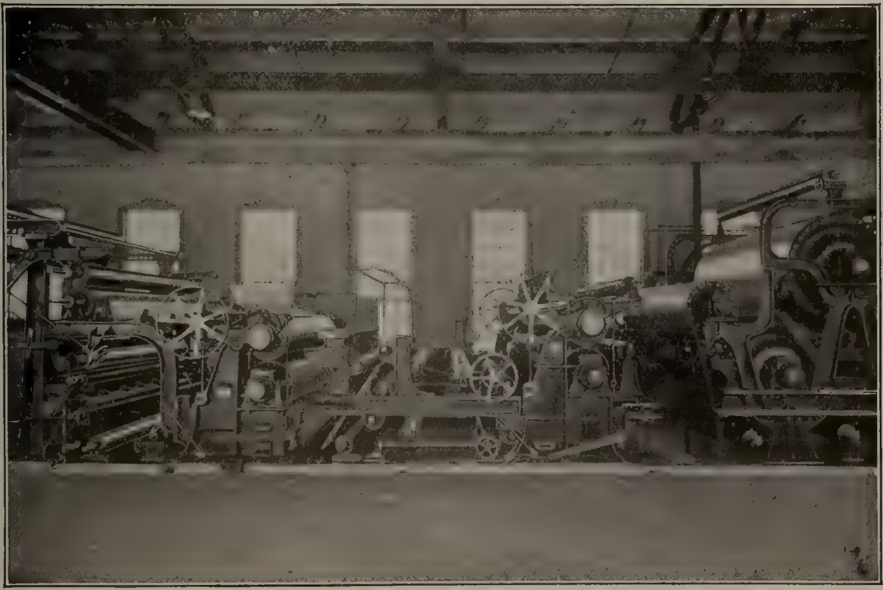

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TOTAL THICKNESS ONLY 2½ TO 2¾ INCHES

Resists the action of the acid and ensures absolute protection to the Digester Plates.
Great durability, therefore large saving in upkeep and repairs.
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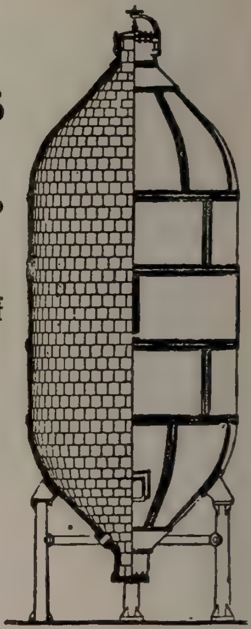

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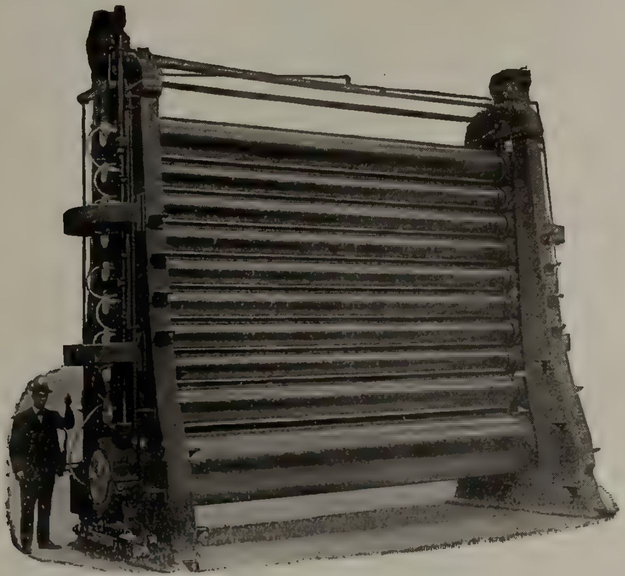

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WITH PATENT HYDRAULIC LIFT **ROLL GRINDING MACHINES**

James Bertram & Son, Limited

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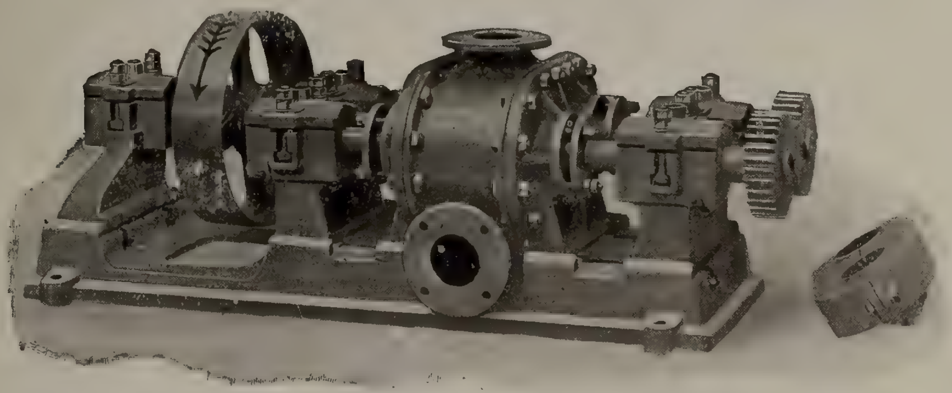

ROTARY DRUM PUMP, Specially Designed for Paper Making Machines

SPECIALTY: PAPER MAKING MACHINERY

Full particulars on application **Telegrams: Bertram, Leith**

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CARTHAGE MACHINE COMPANY

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Manufacturers of

Machinery for Ground Wood and Sulphite Fibre Mills

Barkers Splitters Grinders Wet Machines
Chippers Chip Crushers Compound Rotary Chip
Screens Core Cutting and Core Punching
Machines Pumps—Iron and Bronze Bronze Blow
Valves Bronze Digester and Acid System Fittings

Pulp and Paper Magazine
OF CANADA

A Semi-Monthly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades.

Published by The Industrial and Educational Press, Limited
35-45 St. Alexander Street, Montreal. Phone Main 2662
Toronto Office, 44-46 Lombard Street. Phone Main 6764.
New York Office, 206 Broadway.

Published on the 1st and 15th of each Month. Changes in advertisements should be in Publishers' hands ten days before date of issue. The editor cordially invites readers to submit articles of practical interest which, on publication, will be paid for.

SUBSCRIPTION to any address in Canada, $2.00.—Elsewhere $2.50 (10 Shillings.) Single Copies 20c.

VOL. XII. MONTREAL, JANUARY 15, 1914 No. 2

Utilization of Resinous Woods.

THE article appearing in this issue by Mr. John S. Bates, is the most important discussion of this subject which has ever been published. The utilization of resinous woods in manufacturing paper has been the subject of the greatest importance, and beset with greatest difficulties for a number of years. It is well known that the wood possesses good paper making fibre, but the difficulty in abstracting the resinous matter has been very serious.

This present article, the first instalment of which appears in this issue is a discussion of two years' work which successfully solved this problem. The methods discovered and properties used are unique, and are practicable in commercial practice. There is no doubt that this will mean a great change in the manufacturing of paper in southern United States.

We recently had occasion to comment on work along the same line which was carried out by Mr. McGarvey Cline, formerly Director of the Forest Products Laboratroy at Madison, Wis. These two investigations will certainly revolutionize the use of southern pine in the manufacture of paper—the principles involved and the methods used are of interest to Canadians, for we have in this country a number of woods carrying percentages of resinous matter. Our spruce through western Ontario have sufficient resinous matter to give great difficulty in the manufacture of sulphite. Some other species of wood which we have, contain considerable matter of this nature which does not allow of their use in the ordinary manufacture of paper. These principles worked out by Mr. Bates are of the greatest importance to us, both from a scientific and trade point of view, because there is no doubt that the utilization of these resinous woods of the South will effect the low grade paper market in the United States.

The Canadian Pulp and Paper Association.

THE Association will hold a banquet and meetings on January 22nd, Windsor Hotel, Montreal.

It is not quite a year since the agitation was first started for the formation of this Association. The progress has not been as rapid as many of those interested in the organization had hoped, but we believe that a great many have come to realize the great value of such an organization. There is no doubt that the paper trade in this country has need of a well supported organization of this kind, which will be of unquestionable benefit to each individual member. The main questions which are arising from time to time about trade customs, duties, tariffs, expansion of the industry, and all such matters, can only be handled by a central organization. The Association of the United States has been so beneficial, that the book manufacturers have now organized a separate Association of their own, under Judge Moore.

While the number of mills making pulp and paper in Canada is not very large, yet the needs of this organization are very great, and we are glad to note, are appreciated. All interested in pulp and paper, whether members of the Pulp and Paper Association or not, should attend its meetings on January 22nd, at the Windsor Hotel, Montreal.

Following is the programme proposed.

MORNING at 10.30 o'clock.—Meetings of sections for discussion in market conditions, trade customs, tariffs, and other matters of peculiar interest to the different branches of the industry.

AFTERNOON at 2.30 o'clock.—Election of officers; report on past year's work; discussions on (a) value of statistics, (a) tariff, (c) transportation, (d) technical co-operation.

EVENING at 7.30 o'clock.—Banquet at the Windsor; price of tickets, $5, inclusive.

Scandinavians Disappointed.

THE pulp and paper trade in the old country, especially in England, is talking of nothing else at the present moment but the disappoint of the Scandinavians, which they, themselves, admit in the United States market since the passing of the new tariff law. They have been holding up large stocks for Americans at strong prices, but have found that other competition from Canada and elsewhere has been fairly keen. Many of the largest pulp buyers say that they will be hard hit by Canada as they expected much stronger prices in the American market. This is quite a remarkable circumstance since a great deal of talk was made during the tariff session on this point. The fact that it has not panned out as the Scandinavians themselves anticipated is a matter of the greatest significance. Certainly Canada has not sold very much more sulphite pulp since the new tariff inactment. Conditions have not been very brisk during the last few months. The passing of the Currency Bill has tended to steady matters somewhat so that it is anticipated that trade will be a little brisker than it has been for some time past. The sulphite condition is most interesting at the present moment, but it looks as if Canada would not suffer to any extent.

The accounting department of the Spanish River Company, has been removed from Toronto to Saulte Ste. Marie, to the offices of the Lake Superior Paper Company, under the direction of Lionel Lumb, comptroller of the company. The cost branches in connection with the mills at Espanola, Sturgeon Falls and Sault Ste. Marie, are now conducted at each of these places. The executive and sales offices remain in Toronto.

ELECTRICAL TREATMENT OF CELLULOSE.

A recently published French patent, by Mr. Albert Nodon, deals with a process for electric treatment of cellulose. An application has also been made for an English patent. The inventor remarks that the known methods are expensive, variable and defective, because by dipping the materials to be treated in vats half-filled with saline solution those which are immersed are more affected than what is outside. On the other hand, by previously injecting the materials with various salts and then subjecting them to the action of electric current—the materials being too humid—the current is shunted by the liquid and does not reach the inmost parts. The new process consists in first treating the materials with a saline solution, but only superficially, and then subjecting them to the prolonged action of electric current so as to facilitate penetration of the current into the heart of the materials treated. The passage of electricity is favored by a certain degree of moisture in the cellulose. Sufficiently prolonged its action and ionization, caused by the current, produce complete transformation of the cellulose in form of polymerisation of the molecule. The new substance thus obtained is imputrescible, indestructible by exterior agents, such as wood myceliums in presence of moisture, air and heat. Moreover, mechanical resistance of the cellulose is greatly augmented and physical aspect more or less unchanged.

INFUENCE OF SIZING.

H. Frederking, a German chemist, has just made known the results of his work in determining the influence of the sizing of paper and the resistance of the text of documents to removal by mechanical or chemical means in which he says that the harder the surface sizing and the closer the surface texture of the paper, the more readily are written, typewritten or stamped characters removed.

A striking exception to this rule is found in the case of parchment papers, from which characters in writing ink can seldom be removed entirely without trace. Such papers, however, hardly fall within the range of practical application for documents. As a guard against falsification, document papers should be relatively soft-sized; papers sized with rosin are to be preferred from this point of view to papers sized with gelatin, because certain of the chemical ink removing agents leave stains on rosin sized papers.

The prejudice against tyepwriting for documents is scarcely justified, since many brands of modern typewriter ribbons give characters as difficult to remove as characters written in ink, sometimes even more resistant. The treatment of documents with a protective varnish is of little value as a safeguard against falsification; such varnishes cause the spreading of typewritten or stamped characters and are only available for documents written in ink. With hard tub sized papers, the varnish remains on the surface and is easily removed by solvents, while with softer sized papers the protection afforded by the varnish is so slight that it does not compensate for the unsightly appearance produced.

W. S. Boyd, sales manager of Price Brothers & Co., Jonquiere, Que., was in Toronto last week on his return from an extended business trip to the Western States.

CHEMICAL UTILIZATION OF SOUTHERN WASTE

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The following article is the dissertation covering two years work on the manufacture of pulp and paper from resinous woods.

The results here outlined will revolutionize the use of these woods.

This article is published exclusively by the author in the Pulp and Paper Magazine.

INTRODUCTION.

THERE are two phases of conservation to be considered in dealing with the forestry problem. The first involves provision for the preservation and rejuvenation of timber growth, into which enter such methods as selective cutting of trees, reforestation and prevention of forest fires. The second phase of the problem has to do with the efficient utilization of the raw materials furnished by the forest.

In the utilization of trees not fit for lumber and of the waste from forest and saw mill there is a broad field for the technical chemist. Considerable attention has been paid to these matters during the past few years and the technology of the subject is steadily advancing. The chief retarding influence is that, in spite of the enormous quantities of wood waste, the inherent value of the raw material is relatively small. The economic value of the finished products which can be manufactured from wood waste is in most cases not great and the cost of transportation and treatment of the wood is often prohibitive. The methods of utilizing wood waste differ rather widely in principle and in scope, and there are decided limitations in treating any one species of wood.

RESINOUS WOODS.

One of the most reasonable points of attack is in the direction of waste resinous woods. Several processes for the treatment of these woods are now in successful operation and others give promise of satisfactory development. The representative species are the Douglas fir, the Norway pine and the western yellow pine of the Pacific slope and the long-leaf pine and the associated Cuban pine of the southeastern states. The species of less importance are the digger, lodgepole, sugar and pinon pines of the West and the short-leaf and loblolly pines of the South.

The most abundant of the resinous woods and the most promising from the industrial standpoint is the long-leaf southern pine ("Pinus palustris"). As is well known this pine is the chief wood of the southeast and holds first place among the commercial woods of the country. The utilization of the waste wood is now assuming special significance as an increasingly important factor in the naval stores industry. The virgin forests which have supplied the world with turpentine and rosin are disappearing at an alarming rate and the principles of conservation demand that the tapping and wasting of the living trees should be relieved as far as possible by the recovery of resinous products from the felled waste wood. Moreover, long continued forest operations have resulted in the accumulation of resinous waste in the forest and much of this waste has remained sound by reason of the preservative properties of the oleoresin.

The forests of long-leaf pine occupy a strip some 125 miles wide along the coast of the Atlantic and the Gulf of Mexico and constitute the main timber growth of the states from North Carolina to Texas. By reason of devastation of the forests, the turpentine centre has moved in late years from North Carolina to Florida, while the lumbering centre has advanced to Louisiana and Mississippi. It is estimated that the forest areas cover over 70 million acres and that the stand of long-leaf pine amounts to about 232 billion board feet. (U. S. Dept. Agric., Forest Service, Bull. 99, p. 8).

According to the report of the Census Bureau, the cut for the year 1910 of all eastern "yellow" pines, (of which the greater part was long-leaf pine), amounted to 14 billion board feet. This represents about two-thirds of the total cut of resinous woods throughout the entire country. The consensus of opinion seems to be that in ordinary lumber operations at least 60 per cent of the actual wood in the tree is wasted in transforming the same to sawed lumber, about 35 per cent being lost at the mills in the form of sawdust, slabs, edgings and shavings, and 25 per cent remaining in the forest in the form of tree-tops, branches, stumps, etc. (U. S. Dept. Agric., Y. B. Sep. 534, 1910, p. 257). This would signify that the waste amounted to 21 billion feet, as the census figure refers to finished lumber. Assuming 1,000 board feet to be equivalent to 1 cord, this would represent an annual production of 21 million cords of waste resinous woods in the South. The estimation by Veitch and Merrill (U. S. Dept. Agric., Bur. Chem., Bull. 159, p. 24) of 8 million cords of waste woods of all kinds annually seems to be erroneous, as they have apparently taken the census figure as representing 100 per cent of the actual wood cut.

It is of course impossible to determine exactly the total amount of long-leaf pine waste produced each year. Furthermore, the waste varies widely in oleoresin content and a large proportion would be too lean to warrant treatment for the recovery of resinous constituents. The effective utilization of this class of wood waste by a variety of processes would surpass the present production of the country in the items of low-grade papers (other than newspaper), rosin, rosin oils, turpentine, pine oil, rosin spirits, wood tar, soft wood charcoal and ethyl alcohol.

Composition of Long-Leaf Pine.

The constituents of economic value existing in long-leaf pine are the oleoresin and the wood itself. The products actually obtained from the pine depepend on the methods of treatment.

The oleoresin varies widely in amount but its composition is fairly uniform, the volatile oils comprising approximately 20 per cent of the crude gum, and colophony or rosin making up the remaining 80 per cent. The volatile oils or "crude turps" yield from 60 to 80 per cent of actual turpentine and from 40 to 20 per cent of heavier oils, known collectively as "pine oil." As it exists in the wood, the turpentine consists mainly of terpenes of the formula $C_{10} H_{16}$, chiefly a-pinene with smaller amounts of b-pinene, dipentene, camphene, and traces of other oils. (U. S. Dept. Agric., Forest Service, Bull. 119, p. 7); Bur. Chem. Bull. 144, p. 21). The turpentine fraction distils between 155° and 180°C., the main portion passing over close to the boiling point of pinene (155–156°C.). The pine oil consists essentially of terpineol, with small amounts of borneol, fenchyl alcohol, limonene, cineol and other terpenes and related compounds. Gum turpentine issues from the sapwood of the living tree and consists almost entirely of pinene, whereas the volatile oils of the heartwood contain appreciable amounts of dipetene and heavier oils.

The colophony or rósin consists chiefly of monobasic rosin acids. The main constituent (80–90 per cent) is believed to be abietic acid or its anhydride. Authorities differ as to the exact composition of abietic acid, some holding to the formula $C_{20} H_{30} O_2$ and others to $C_{19} H_{28}O_2$ (see Forest Service, Bull. 119, pp. 7–8 for references). There are no esters, but bodies of a lactone nature are present in small quantity, as shown by the discrepancy between the saponification and acid numbers.

The true wood, (Klason, see Schwalbe, "Die Chemie der Cellulose," pp. 395 and 441; Dean and Tower, J. Am. Chem. Soc., 29, (1907), p. 1119) considered apart from oleoresin and moisture, is essentially lignocellulose, made up of 55–65 per cent of stable cellulose, $(C_6H_{10} O_5)n$, associated in a colloidal state with about 30 per cent of lignin, a carbohydrate of uncertain composition and higher carbon content, approaching the empirical formula $C_6H_7O_3$ (Cross and Bevan, Researches on Cellulose, 3). The balance is made up of lower carbohydrates, chiefly pentosans and hexosans, and small amounts of protein and mineral ash. The moisture content of pine varies from about 5 per cent in very fat wood to 30–40 per cent or more in some classes of lean wood, average air-dry wood containing about 20 per cent of moisture. This is an important consideration in all calculations.

Classification of Wood Waste.

It is well to have in mind the various classes of wood waste which are availabe. The mill waste, which represents about 35 per cent of the original tree, is chiefly sawdust, slabs and edgings. The sawdust is usually low in oleoresin content, because the average saw lumber is lean. Moreover, its fine state of division allows more or less volatilization of the turpentine. The slabs are available in large quantities and offer one of the most convenient forms of raw material. Their percentage of bark is of course very high and its removal is a problem to be considered. Furthermore, the slabs come from the outer sapwood of the tree, where the oleoresin content is lowest. The richest slabs are those from the "box face" of trees which have been tapped for gum spirits of turpentine. The waste remaining in the forest is abundant, but is not so accessible. Large branches, treetops and occasional logs left by the lumbermen afford raw material in a form compact enough for handling. Stumps usually have a high cleoresin content and offer a great bulk of solid rich wood. Their utilization is of especial significance in cases where the land is being cleared for agricultural purposes. Uprooting of the stumps and perhaps freeing from dirt and roots must be taken into account. The most attractive class of forest waste is the "dead and down" material known as "lightwood." After the period of turpentine orcharding, the exhausted trees are in many cases allowed to remain until they fall. The bark and the outer sapwood decay and in five to fifteen years there is left a resinous log, which resists the natural processes of disintegration for long periods. This explains the large supply of lightwood now available.* Lightwood is often charred by the ground fires which run through the pine forests.

Turpentine Orcharding.

The oldest and most approved method of obtaining rosin and turpentine depends on making incisions in the living tree and collecting the oleoresinous exudate. This general operation is known as "orcharding." The turpentine is recovered from the crude gum by distillation and the non-volatile rosin is purified by a simple process of straining while still in a molten condition.

The "gum spirits of turpentine" so obtained are always taken as the highest standard of quality, since they are not contaminated by those decompositions products formed during certain other treatments of resinous woods. The orcharding method is simple and requires but little outlay for apparatus. The exhausted trees are available for lumber, and the choice of areas for orcharding is now usually made with this end in view. On the other hand, the yield from a single tree is small, the average being 10–12 pounds of crude gum per annum (Herty, J. Ind. Eng. Chem., Jan. 1913, p. 67). This necessitates the exploitation of a very large number of trees and any but the most careful methods of orcharding result in rapid devastation of a forest.

Destructive Distillation.

The aim In this process is to heat the richer grades of pine in closed retorts at progressively higher temperatures in order to first liberate the volatile oils of the wood in a comparatively unchanged condition and finally to decompose the rosin and the wood into a series of products, which are for the most part volatile at high temperatures. Below 200°C. the main products—moisture, turpentine and pine oil—are primary in nature. With continued increase in temperature the wood itself suffers decomposition, with formation of water and small amounts of acetic and formic acids, then light tar oils, gas and small amounts of methyl alcohol, and finally heavy tar oils; charcoal is left as a residue in the retort. At temperatures approaching 300°C. rosin begins to decompose, the successive products being water, light rosin spirits, heavier rosin oils and pitch.

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*A. Tschirch, in "Die Harze and die Harzbehalter," second edition, describes the increased accumulation of rosin in a wounded or dead tree as a pathological process carried on by minute organisms.

The main problems in the destructive distillation process are uniform distribution of heat and accurate control of temperature. The types of retorts are numerous and differ rather widely in methods and heat application.

The fractions obtained by the destructive distillation of resinous wood are for the most part mixtures of the decomposition products of rosin and wood. Purification of the products is for this reason difficult and imperfect. The number of end products is relatively large, but many of them are of low inherent value. Destructive distillation has the advantage, however, of adapting itself to rough and even charred wood, without the necessity of finely dividing the same. Furthermore, certain valuable products, such as pine tar, tar oils and creosote, can be obtained by this process alone.

Steam Distillation.

Although the boiling point range of turpentine lies above 155°C., both turpentine and pine oil are volatile with steam at temperatures above 94–96°C. The steam distillation process aims to remove the volatile oils from the wood by this simple agency. The finely divided resinous wood is subjected to the action of saturated or superheated steam in suitable retorts for several hours, until the greater portion of the crude turpentine has been carried over. The volatile oils are readily separated from the aqueous layer in a distillate and by a series of fractional distillations in a column still the end products, wood turpentine and pine oil, are isolated in a favorable state of purity.

While the principles involved in the steam distillation process are very simple, the utilization of the wood is incomplete, in that only the volatile constituents are recovered. The limitations have proved so great that nearly all the commercial plants have ceased operations within the past two or three years. It seems probable, however, that steam distillation will remain as an important step in more comprehensive treatments of resinous pine.

EXTRACTION PROCESSES.

I. Volatile Solvents.

Rosin and turpentine are soluble in a considerable number of volatile solvents, the most common of the cheaper ones being naphtha, gasoline and coke-oven benzene. The ordinary commercial solvent is a light gasoline, all fractions of which are volatile below 130–140°C. The extraction process depends on the removal of the rosin and turpentine from the finely divided wood by the agency of a solvent; the extract is subsequently distilled to recover first the solvent and finally the turpentine and pine oil, leaving the rosin as a residue

In some cases (Walker, J. Soc. Chem. Ind., 1911, p. 394; U. S. Pat. 922,369 and Yaryan, U. S. Pats. 915,400; 964,728; 992,325), the turpentine is first removed from the shredded wood by steam distillation in order to escape the usual danger of retention of solvent by the turpentine. There is also a possibility of using the extracted wood for the production of paper pulp, although the fine state of division of the wood would detract from its value in this connection.

The main products—turpentine, pine oil and rosin—are in most respects of very favorable quality, since they are free from those decomposition products formed at higher temperatures in the other processes. The chief difficulty lies in the loss of solvent during the cycle, amounting as it does to 20–25 gallons per cord of wood extracted.

2. Alkalis.

When rosin is heated with caustic soda, sodium carbonate or equivalent alkali, the rosin acids combine with the alkali to form a soluble rosin soap. Turpentine and pine oil are stable in presence of dilute solutions of alkali and may be removed therefrom by distillation with steam. Wood itself is affected only in slight degree on heating with dilute alkali at low steam pressures, a small proportion of the lignin being carried into solution. These well-known facts have suggested the use of dilute alkaline solutions to effect a separation of the primary constituents of resinous wood.

A more detailed discussion of the factors entering into the extraction of resinous wood with alkalis will be found in the second part of this paper.

Bath Processes.

Commercial operations on a limited scale have been carried on for some time whereby the turpentine and pine oils and incidentally part of the rosin are extracted from the wood by a hot bath of non-volatile or high boiling material. Molten rosin alone and mixtures of rosin, pitch, pine tar, pine oil, etc. have been used as baths for flooding the wood. Final injection of steam into the bath carries off the turpentine and pine oil and permits of using the bath for treating the next batch of wood. The extracted wood may be used as fuel or it may be destructively distilled.

Hydrolysis.

The hydrolysis of the lignocellulose complex of wood by acids and the production of ethyl alcohol from the fermentable sugars so formed constitute a problem of ever-growing interest. Longleaf pine has been the raw material used in a large proportion of the investigations along these lines and at least two alcohol plants in this country are now treating this wood on a large scale.

Very dilute solutions of sulphurous, sulphuric or hydrochloric acid are used as hydrolyzing agents and rather high steam pressures are necessary to effect the decomposition of the lignin and cellulose. The fermentable sugar, calculated as dextrose, amounts to 10–20 per cent of the dry weight of the wood under favorable conditions. The extract is neutralized with lime, cooled, and treated with yeast. After fermentation is complete, the alcohol is distilled off and rectified.

The attractive feature of the process is the high yield of alcohol, a material which is becoming of more and more importance in the industries. Furthermore, it is the only process especially suited to the use of sawdust, and it does not depend for its success on the oleoresin content of the wood.

Before leaving this subject, an alternative use of the hydrolyzed wood mass should be mentioned, It has been found (Zimmerman, J. Royal

Soc. Arts, 61, 1912, pp. 69–81; J. Soc. Chem. Ind. 31, p. 1197) that the sugar liquor and "pulp" formed by treating sawdust with SO_2 solution under pressure is admirably suited as a basis for a valuable cattle food.

Paper Pulp.

The use of long-leaf pine for the manufacture of pulp and paper is an industrial development of recent years. Laboratory and commercial experiments on this new raw material have proved fairly successful and the indications are that a paper industry of no mean proportions will be built up in the South. Several plants are already in operation and other extensive projects are claiming the attention of pulp and paper experts.

The soda process depends on the decomposition and solution of the lignin by a caustic soda liquor at high temperature and pressure. Of perhaps more significance is the sulphate process. The presence of the sodium sulphide improves the color of the pulp and simplifies bleaching; at the same time, the fibre is smoother and firmer, and imparts better wearing qualities to the paper.

Sound, lean wood is best adapted to pulp making. In addition to the direct supply of logs, the large quantities of mill waste in the South furnish a convenient and cheap source of raw material.

To make the treatment of the more resinous classes of pine waste reasonable and profitable, attention must be given to by-products. Rosin and turpentine may be first removed by a volatile solvent (Rowley, U. S. Pat. 942,106). Several of the methods suggested have aimed at preliminary removal of the volatile oils in a pure form by distilling at moderate pressures with steam alone (Hough, U. S. Pat. 903,859) or in presence of alkali solutions (Craighill and Kerr, U. S. Pat. 817,960). It has been claimed that part of the rosin can be melted down and tapped from the bottom of the digester (Saylor, U. S. Pat. 1,004,473; Hoskins, U. S. Pat. 770,463). The spent pulping liquors may be evaporated and destructively distilled to yield rosin spirits, pyroligneous acid, tar, etc. (U. S. Dept. Agric. Bur. Chem., Bulletin 159).

EXPERIMENTAL

Scope of Investigation.

In the chemical utilization of wood waste it seems highly desirable to aim at simplicity of treatment and at the same time provide for as complete a recovery of valuable products as is economically possible. Usually one type of treatment is paramount in a plant and any complication is looked upon with disfavor. And it is quite apparent that a succession of widely varying types of treatment is not conducive to the smooth operation of a mill. A limitation of the number of end products is a decided advantage and these products should be obtained in the most direct manner and in as pure an initial form as possible.

It was with these considerations in mind that an investigation of southern pine waste was undertaken. The problem was limited to the more resinous classes of wood waste. Considering the recent demonstrations that excellent paper pulp can be obtained from long-leaf pine, it seemed advisable to employ a modified pulping treatment. This necessitated the preparation of the wood in the form of chips of the size demanded by a pulp mill. It remained to choose a method for treating the chips to separate the oleoresin from the wood itself and allow isolation of the three end products—turpentine, rosin and paper pulp.

Since rosin is readily saponified by alkalis and thereby rendered soluble in water, it was decided to make use of this principle in extracting the rosin from the wood. A mild treatment was necessary to prevent undue attack of the actual wood by the alkali. The fact that turpentine and pine oil are volatile with steam at temperatures far below their boiling points suggested carrying out the preliminary extraction at low steam pressures, thereby allowing separation of the volatile oils. After removal of the rosin and turpentine the wood could be steamed with stronger alkali under more severe conditions, for the production of paper pulp.

In addition to the investigation of the factors affecting such a treatment of the wood, it was important to determine the quality and yields of the products and to provide for their purification.

Historical.

There have been a number of suggestions for the utilization of resinous materials involving the principle of alkai extraction.

Craighill and Kerr (U. S. Patent 817,960, April 17, 1906) have patented a process by which the chipped wood is treated first with a small volume of liquor containing an amount of caustic soda "just sufficient to saponify the rosin and oils and neutralize the (volatile) acids without dissolving other extractive matters of the wood." Steam is admitted long enough to distil the terpenes; water is then added in order to submerge the chips in alkaline solution, and steaming is continued until saponification of rosin is complete. This solution is then drawn off and the chips treated with a stronger caustic solution for the production of paper pulp.

J. Aktschourin (French Patents 432,998, Aug. 5, 1911, and 433,424, Aug. 11, 1911; Ger. Pats. 248,275, July 12, 1912 and 257,015, Jan. 12, 1913) provides for the extraction of resinous material by heating with dilute alkali below 100°C. at several atmospheres pressure. The lower temperature lessens the attack of the lignin. The liquor is drawn off and cooled to precipitate a certain amount of emulsified resin and rosin soap. The filtrate is used in digesting the fibrous material at high steam pressure for pulp.

Where turpentine is the only product desired, alkali has in some cases been added primarily to disintegrate the rosin and thereby permit a more nearly complete distillation of the volatile oils (Hough, U. S. Pat. 903,471).

Kerr (U. S. Pat. 832,863) has suggested a continuous process for the removal of turpentine and rosin from wood, the turpentine being first distilled with steam and the rosin being subsequently dissolved in alkaline liquor.

Preliminary Experiments.

From a shipment of assorted pine waste, the "box-face slab" material was selected as being best suited to a laboratory investigation. This wood was sound and clean, and very rich and uniform in oleoresin content. When reduced to chips or shavings the wood had a strong turpentine odor and burned freely with a characteristic, smoky flame. Box-face slabs constitute a comparatively expensive and restricted source of raw material for commercial supply and the oleoresin content (30–40 per cent) is higher than that of average lightwood (15–25 per cent). This material, then, should present perhaps the severest conditions for complete extraction of rosin and turpentine, but the yields must be considered a maximum for southern pine waste.

A series of experiments was first made to determine the behaviour of the wood with alkalis under various conditions of temperatures and pressure. Sample slabs were carefully cleaned by the removal of bark, rosin "scrape" and other surface material. Only the clean, inside wood was used in the investigations. Some of the wood was reduced to large chips—about 1 in. x $\frac{3}{4}$in. x $\frac{1}{8}$in., some to small chips—about $\frac{1}{2}$in. x $\frac{1}{4}$in. x 1/32 in.—and another portion to thin shavings.

The action of volatile solvents was of course rapid and simple. Shavings and small chips were readily freed from rosin and turpentine by extraction in a Soxhlet, leaving the wood clean and decidedly whiter in color. The slow penetration in the case of the larger chips pointed to the difficulties which would be encountered in using this type of treatment on chips of the normal pulping size. Ether, gasoline, ligroin and petroleum ether, all yielded clear, bright yellow rosin, showing the excellent quality of the rosin as it existed in the wood. Ethyl alcohol, methyl alcohol, and acetone showed slightly greater extractive powers, the rosin, however, being deeper in color and somewhat cloudy. Ether is the most satisfactory solvent for rosin, the solubility being 38–39 per cent at 23°C. (H. A. Loos, "A Study on Colophony Rosin," Columbia University, 1900), and was used in subsequent quantitative determinations.

Extraction with alkalis is different in principle. The rosin is saponified and dissolved as a soap, while the turpentine is liberated from the rosin without itself dissolving in the alkaline solution. An important consideration is that the alkali causes partial decomposition of the wood itself. The lignone group of the wood is converted by alkaline solutions at elevated temperatures into soluble derivatives, which are acid in nature but of somewhat uncertain composition (Cross and Bevan, "Wood Pulp and its Uses," p. 62). This principle is carried to the limit in ordinary pulping operations, where the final pulp consists of cellulose practically free from lignin. Heating the wood in dilute caustic solutions at the moderate temperatures necessary for rosin extraction represents the initial stage of lignin decomposition. The dissolved bodies from this source consist mainly of organic acids of the type of saccharinic and isosaccharinic acids, as well as those of a lower order, such as formic and acetic acids. In addition, there are dissolved those water-soluble bodies and lower carbohydrates, which exist in the wood to the extent of 5–10 per cent—chiefly pentosans and hexosans, such as the glucosides of xylose, mannose, etc. (see Klason and Segerfelt, Papierfabrikant, **9**, 1911, pp. 1093–9). For convenience, the decomposition products of the lignin of the wood will be designated as "humus" throughout the discussion.

Extraction of Rosin-free Wood with Alkali.

To study the behaviour of the humus, pine shavings were first extracted with ether and then heated with dilute solutions of caustic soda. The alkali extracts were clear, and brown or cherry red in color.

Addition of excess caustic soda caused no precipitation of the organic bodies. The same was true of treatment with sodium chloride. Barium chloride gave a fine, brown precipitate of the barium salts of the humic acids, leaving a pale orange-colored supernatant liquor. Titration with mineral acids gave no precipitate up to the sodium bicarbonate stage (phenolphthalein end-point). On fully acidifying, there resulted almost complete precipitation of the humus, due to the breaking up of the sodium salts. The humus was brown, granular and easily washed by water. Only a trace proved soluble in ether, but the mass became somewhat gelatinous. After acidifying a portion of the alkali extract to the sodium bicarbonate stage, CO_2 was passed through the solution. A large proportion of the humus was precipitated. (see Rinman, U. S. Patents 1,005,882, 1,017,320 and 1,045,889, and J. Soc. Chem. Ind., 31, p. 183).

Extraction of Resinous Wood with Alkali

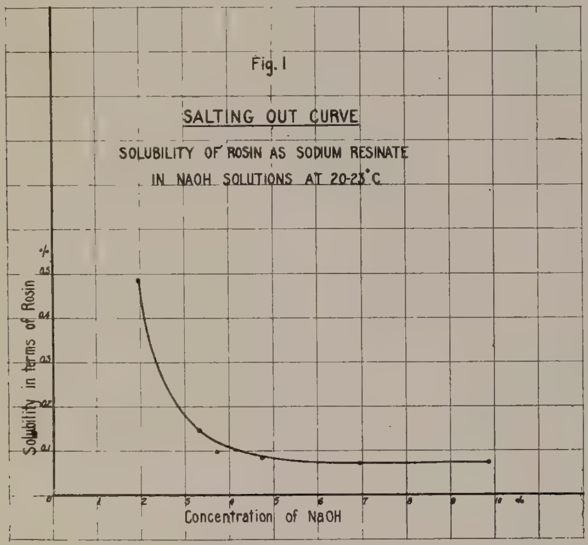
The behaviour of the resinous wood with alkalis is modified by the presence of rosin and turpentine. Dilute caustic soda and sodium carbonate showed little action on resinous shavings or chips in the cold. Shavings were readily extracted, however, by heating at 70–100°C. Chips were much more resistant, although the small chips were thoroughly extracted on boiling with dilute caustic soda for $1\frac{1}{2}$–2 hours, accompanied by evolution of turpentine.

The brown extracts consisted mainly of sodium resinate and the sodium salts of humic acids. Addition of excess caustic soda in the cold caused precipitation of most of the rosin soap, which carried down some of the humus mechanically. Sodium chloride gave the same general action. Barium chloride gave a precipitate of the barium salts of both the rosin and humic acids. As in the case of the pure wood extract, mineral acids gave no precipitate on titrating to the phenolphthalein end-point. Further additions precipitated rosin and humus together, the small quantity of humus being entrapped by the gummy rosin. Direct melting of the precipitate gave bright rosin, with humus particles disseminated throughout. Extraction with ether involved some difficulty in separating the ether layer from the gelatinous humus, but yielded a clean rosin of pale brown color. On saturating the alkali extract with CO_2, partial precipitation of both rosin and humus took place.

The "Salting-Out" Method for Isolation of Rosin.

Isolation of the rosin content of the alkali extract was most conveniently accomplished by salting out the rosin soap with caustic soda. Sodium chloride was apparently just as effective, but rather complicated the process by the introduction of another reagent. The caustic soda method was chosen because direct and simple. Humus itself is soluble in alkaline solution, but a small part is carried down by the colloidal soap. Sodium resinate is quite soluble in hot alkaline solutions, as well as in neutral or faintly alkaline solutions in the cold, but is only slightly soluble in cold alkaline solutions when the concentration of free caustic soda exceeds about 4 per cent. This solubility determines the loss in recovery of the soap. The method has the advantage of utilizing the same reagent as is employed for extracting the wood and cooking for pulp. No acid is necessary for precipitating the free rosin, if the soap is to be used as such, and no acid-resisting apparatus need be provided. The alkali used in extracting the wood and precipitating the soap can be saved partly in the form of sodium resinate (thereby enhancing the value of the rosin fraction), and partly in the form of brown, supernatant liquor to be used as a source of alkali for the soda cook of the extracted chips. After the pulping operation, the alkali can be recovered in the usual way by evaporating, incinerating and causticizing the waste soda liquor.

As regards actual manipulation, it was found best to add the excess of caustic soda to the hot extract, so that precipitation of the soap took place rather slowly as the solution cooled down. Very strong alkali—above 10 per cent NaOH—gave somewhat syrupy solutions, with increased contamination of the soap by humus and without appreciable gain in the quantity of soap precipitated. The soap precipitate proved difficult to filter. The liquor was separated by draining or syphoning. With this procedure the soft precipitate retained an appreciable quantity of liquor. The bulk of the humus was removed from the soap by dissolving the same in the minimum amount of hot water and salting out again with caustic soda.



To determine the power of caustic soda in salting out rosin soap, a series of experiments were carried on with pure rosin on a quantitative scale. The results are summarized in Figure 1.

Clear, bright rosin, prepared by extracting a good grade of paper-maker's rosin with ether, was powdered and dissolved in a slight excess of warm, dilute caustic soda solution. Separate portions of this strong rosin soap solution were diluted with water and treated while warm with varying quantities of strong NaOH solution, so that part of the sodium resinate was in each case salted out. The solutions were placed in stoppered bottles and allowed to stand overnight to come to room temperature (20–23°C.) and to assume a state of saturation at that temperature. The solutions were then filtered, giving clear, pale-yellow filtrates. 400 cc. portions were acidified and shaken with ether to determine the rosin content. The results have been expressed in percentage strength of the solutions in terms of rosin (present as soluble rosin soap). The figures also represent solubility of rosin in grams per 100 cc. The balance of the solution was in each case titrated with standard H_2SO_4, using methyl orange as indicator. The results represent the total alkali expressed in terms of NaOH. The error due to the precipitation of free rosin by the acid is practically negligible. The actual causticity of the alkali varied from 95 to 97 per cent, small quantities of sodium carbonate being unavoidably present.

The results are not strictly accurate or comparable with one another. This is apparent, because of the presence of sodium carbonate in the caustic solutions and because of the slight differences in temperature. Furthermore, the quantity of rosin soap precipitated out may have had some influence on the solution itself, by reason of the colloidal tendency of sodium resinate. However, the general effect of increasing the strength of the caustic soda is quite apparent. The solubility of rosin soap in 1 per cent NaOH amounted to several grams per 100 cc., and for this reason was not determined. In 1.98 per cent NaOH the solubility was 0.4817 grams per 100 cc., while in 3.33 per cent caustic it dropped to 0.1445 grams. After a concentration of about 4 per cent NaOH was reached there was no pronounced decrease in solubility of the rosin soap; 10 per cent NaOH gave no more complete precipitation than 7 per cent caustic. This shows that rosin soap can be effectively salted out by strengthening the solution to 4 per cent NaOH or more, thereby leaving a supernatant liquor which would be of a convenient concentration for cooking the extracted chips for pulp.

A few quantitative determinations with sodium carbonate and sodium chloride showed that these reagents had practically the same salting out power as caustic soda when compared on an equivalent weight basis.

In applying the salting out method to the alkali extracts from resinous wood, it was found that the presence of dissolved humus, etc., increased to a slight degree the solubility of the rosin soap in the strong alkali.

EXTRACTION OF RESINOUS PINE WITH ALKALIS.

Temperature, pressure and nature of alkali proved to be important factors in the extraction of rosin and turpentine from the wood.

1. Experiments with Caustic Soda. Atmospheric Pressure.

Taking into consideration the necessity for steam distillation of the crude turpentine, little attention was given to extraction at temperatures much below 100°C.

Shavings heated at 100°C. in a dilute solution of NaOH, containing 1.5 times the amount of caustic theoretically necessary for saponification of the rosin in the weight of wood used, were completely extracted within 1 hour. This was determined by thoroughly washing the shavings with hot water, drying and extracting with ether. On the other hand, the largest chips (1 in. x $\frac{3}{4}$ in. x $\frac{1}{8}$ in.) were imperfectly extracted by treating at the boiling temperature with twice the theoretical amount of NaOH for a much longer period. The small chips were thoroughly extracted when 3 times the calculated amount of NaOH was used. The larger chips not only retarded the penetration of the alkali, but occasioned greater neutralization of the caustic before penetration was complete, by reason of the longer time in contact with the alkali and more extended decomposition of lignocellulose. The extracts were much darker on this account.

2. Heating Under Pressure.

For the preliminary experiments at elevated temperatures a small autoclave of about 1500 cc. capacity was used. The autoclave was fitted with a pressure gage, thermometer pocket and relief line leading to a condenser.

With shavings the evolution of turpentine commenced as soon as pressure was evidenced and the main bulk of the volatile oils ditilled over with a low ratio of water vapor in a very few minutes. In about half an hour the yield of turpentine amounted to approximately 35 gallons per cord. Later experiments showed that the true turpentine content of this wood was about 45 gallons per cord. Frothing was excessive, especially during rapid evolution of the turpentine and care was necessary in controlling the relief line. Extraction of rosin was rapid and the extracts were noticeably darker than those obtained below 100°. The caramel odor detected in all the alkaline extracts was more pronounced in this case.

3. Vacuum Treatment.

The apparatus used consisted of a hemispherical porcelain bowl of about 4 liters capacity, set in a water bath and surmounted by a convex glass cover resting on a rubber gasket. A thermometer was inserted in the top and the delivery tube was connected to a condenser and receiving flask, the side tube of the latter being attached to a manometer and suction pump.

500 grams of thin chips were treated with 2500 cc. of 2.4 per cent NaOH solution, calculated to supply 3 times the amount of alkali necessary for saponification, The water bath and suction pump were first adjusted to carry on distillation at a high vacuum—20–25 inches—so that the temperature could be held below 70°C. The action of the caustic was not very rapid.

Frothing was excessive while turpentine was being evolved and constant attention was necessary to prevent surging over of the liquor. After four hours heating the distillate measured 165 cc., containing 28 cc. of water-white, sweet-smellng turpentine, which represented a yield of 27 gallons per cord. The recovery of volatile oils was incomplete and undoubtedly the distillate contained only the lighter fractions. At this stage the chips seemed pretty well extracted. A sample of the alkali extract gave a very clean, white precipitate of rosin soap on cooling, and the supernatant liquor was transparent and light cherry red in color.

The main portion was heated for some time longer under about 8″ vacuum, and distillation proceeded much more rapidly at 85–90°. A small additional amount of turpentine was obtained, bringing the yield up to 30 gallons per cord. The liquor assumed a decidedly darker color, but the rosin soap precipitate was much cleaner than in the previous experiments.

EXPERIMENTS WITH SODIUM CARBONATE.

Sodium Carbonate was tried as an extracting agent in the hope that the attack of the lignocellulose would be minimized and solution of the rosin accomplished satisfactorily.

1. Atmospheric Pressure.

Shavings were readily extracted by dilute solutions of sodium carbonate at temperatures approaching the boiling point. The action was slow at lower temperatures, but when shavings were added to a boiling solution of carbonate, there was instantaneous action, evidenced by vigorous frothing due to evolution of CO_2 and turpentine. After boiling for 3 hours, the solution was cooled, giving a clean-looking rosin soap precipitate and a transparent, reddish liquor. It was found that the extracts were decidedly freer from humus than in the case of NaOH, but all the solutions were brown and the problem of humus contamination was only one of degree.

2. Heating Under Pressure.

To determine the effect of pressure, 300 grams of thin chips were heated in the autoclave with 1100 cc. of 4.5 per cent Na_2CO_3 solution, containing 3 times the amount of Na_2O theoretically necessary for saponification. In $\frac{1}{2}$ hour the temperature reached 100°C. and in the next 15 minutes, while the pressure rose to 30 pounds, 16 cc. of turpentine distilled over, equivalent to 26 gallons per cord. The heating was continued for a total of $2\frac{1}{2}$ hours up to 45 pounds pressure . The combined "turps" represented a yield of 33 gallons per cord. The final extract was dark brown, showing that carbonate even at low pressures has a decided action on the lignin. On cooling, the soap precipitate was whiter than in the case of NaOH.

3. Vacuum Treatment.

250 grams of thin chips were heated in the vacuum apparatus with 1500 cc. of 2.7 per cent carbonate solution (3 times theory). As low temperatures were ineffective, the water bath was kept boiling. After an hour or more at atmospheric pressure the solution was yellowish and considerable rosin was dissolved. Distillation was then carried on under a vacuum of 12–15 inches and water vapor and volatile oils came over at 78–82°C. Even after 4 hours the yield of turps only represented 15 gallons per cord. The liquor gave a very white precipitate of soap on cooling and the solution was perfectly transparent. However, removal of the turpentine was far from being complete.

In general, then, caustic soda seemed to be the more effective agent for extraction. Sodium Carbonate gave lighter extracts and somewhat cleaner soap precipitates, but penetration of the wood was incomplete and frothing rather more pronounced. Elevated temperatures and pressures facilitated the removal of rosin and turpentine, but occasioned greater attack of the wood itself. The size of the wood units proved to be a highly important factor in extraction of the oleoresin. A fine state of division—represented by the shavings—greatly simplified the problem of extraction. On the other hand, the production of good paper pulp necessitates the preparation of the wood in chip form and this introduces some complication in the preliminary alkali treatment.

Production of Pulp.

Preliminary experiments were made to determine the nature of the pulp obtainable from the boxface slab material. The cooking was done in the autoclave described above, the apparatus being standardized by the use of commercial spruce chips. Caustic soda was employed as cooking agent The washed pulp was disintegrated in a small experimental beater and sample sheets were made up on a hand frame and in a wire stamp. The sheets were dried on a steam-heated dryer-roll designed for the purpose and in some cases finished on a gas-heated calender roll. In this way a rough idea could be obtained of the relative merits of the different pulps for the production of paper.

Without going into detail, it was found that fibre of good quality was obtainable from the resinous long-leaf pine. Shavings gave low yields of rather short and non-uniform fibre, showing the necessity of preparing the wood in chip form. The pulp from the resinous chips was characterized by favorable length and strength of fibre. There was no appreciable difference between the pulp obtained from the resinous wood direct and that from the chips which had been first extracted with NaOH or Na_2CO_3. The pulp from the resinous chips was harder to handle, because of the large amount of rosin soap mixed therewith.

The yields of moisture-free pulp varied from 17 to 25 per cent of the weight of the original wood, depending on whether the cooking was carried to the point of soft, light-brown pulp or stopped at the "raw" stage to give stiffer, darker fibre. Such yields would be too low to warrant a simple pulping treatment of the wood, although the figures represent the normal yields of 35–50 per cent on the basis of moisture—and resin-free wood. The recovery of rosin and turpentine becomes essential in the treatment of rich wood.

Pollution.

By ALEX. ANNANDALE.

This is a worry which Canadian Papermakers have not yet had to trouble much about, but it is a sure thing that sooner or later they will be forced to take up the question seriously. Doubtless the prevention of pollution is a very proper thing but when insufficiently informed legislators pass iron-bound laws binding manufacturers to impossible standards of perfection in outflow waters and when these laws are administered in a rigid fashion by local officials then the trouble begins.

In Great Britain most of the rivers are merely brooks in comparison with Canadian rivers, and the flow of water being so much less it is much more easy to cause serious pollution. Again, population in the manufacturing districts at any rate, is very much denser, so that there is much more sewage pollution. It is undeniable that the factories of Canada are rapidly increasig, and they are sure to continue to do so, and so will the population.

Manufacturers may be quite sure that their pollution will be the first to be attacked and handled by the legislature. It would therefore appear to be the duty of every manufacturer to do all in his power not to pullute and so give no handle for legislation. It may be taken for granted that no manufacturer can maintain a legal right to pollute any stream.

It is also a fact that a very great deal of pollution can be prevented by ordinary care in the process of manufacture. This means some expenditure, but that expenditure, in most cases will lead to economy and enhanced profit in manufacturing.

The paper-makers worst polluting material, is bleach, that is to say it is the most deadly chemical he uses, as far as fish life is concerned, and fish have to be carefully considered as the death of a few fish below the mill means sure trouble in Great Britain.

Before pollution got to be such a serious matter over there, papermakers were not nearly so particular in getting all available strength out of the bleach, often a test of the sludge would show 4% to 5% of chlorine, but now this is cut down to $\frac{1}{4}\%$ to $\frac{1}{2}\%$. This has been done by more care and better plant, every time the saving made has paid good interest on any proper expenditure.

This sludge was at one time allowed to run into the rivers or streams but now such a thing is never permitted. It is washed till no more chlorine can be got out of it and then run onto cheaply constructed but effective filter tanks and allowed to solidify, after which it is conveyed to the rubbish tip, unless arrangements can be made with neighboring farmers to take it away and mix with their other manure.

When boiling raw materials with caustic soda, we have another fertile source of pollution. The brown liquor or lye after boiling is not injurious to fish life unless it is very strong, but it discolors a stream badly and also makes a lot of froth on the surface. This trouble has been to a large extent overcome by the steady improvement in evaporating and recovery plants. Since the writer commenced business the percentage of recovery has steadily crept up, till now the most modern plants get a recovery of 85% to 90%. Needless to say this pays. Even if working, the best possible recovery plant there is always some discolored brown washing water to get rid of which it will not pay to evaporate. The best way to get rid of this without trouble is to have a general tank into which all the non-usable waste waters about the mill are allowed to gather; a pipe fitted with an adjustable valve leads from this tank to the stream and the valve is so set that there is continually a steady flow. The idea being to have the outflow constant and avoid a great rush of pollution when emptying a boiler or washing up machines, let it dribble away all the time, and so it will do no harm and never be noticed.

The lime used for recausticizing the recoverd soda must be treated in a similar way to the bleach lime.

Other sources of pullution are the washing pulp waters and machine waters.

If one has proper pulp washing arrangements it is not advisable to re-use this water; but as regards the machine waters, every drop should be re-used that can be collected free from grease and dirt of various descriptions.

The writer is quite convinced that the mill which makes the most intelligent efforts to stop pollution will be the mill to get the largest yield from materials used and so be able to produce at low cost.

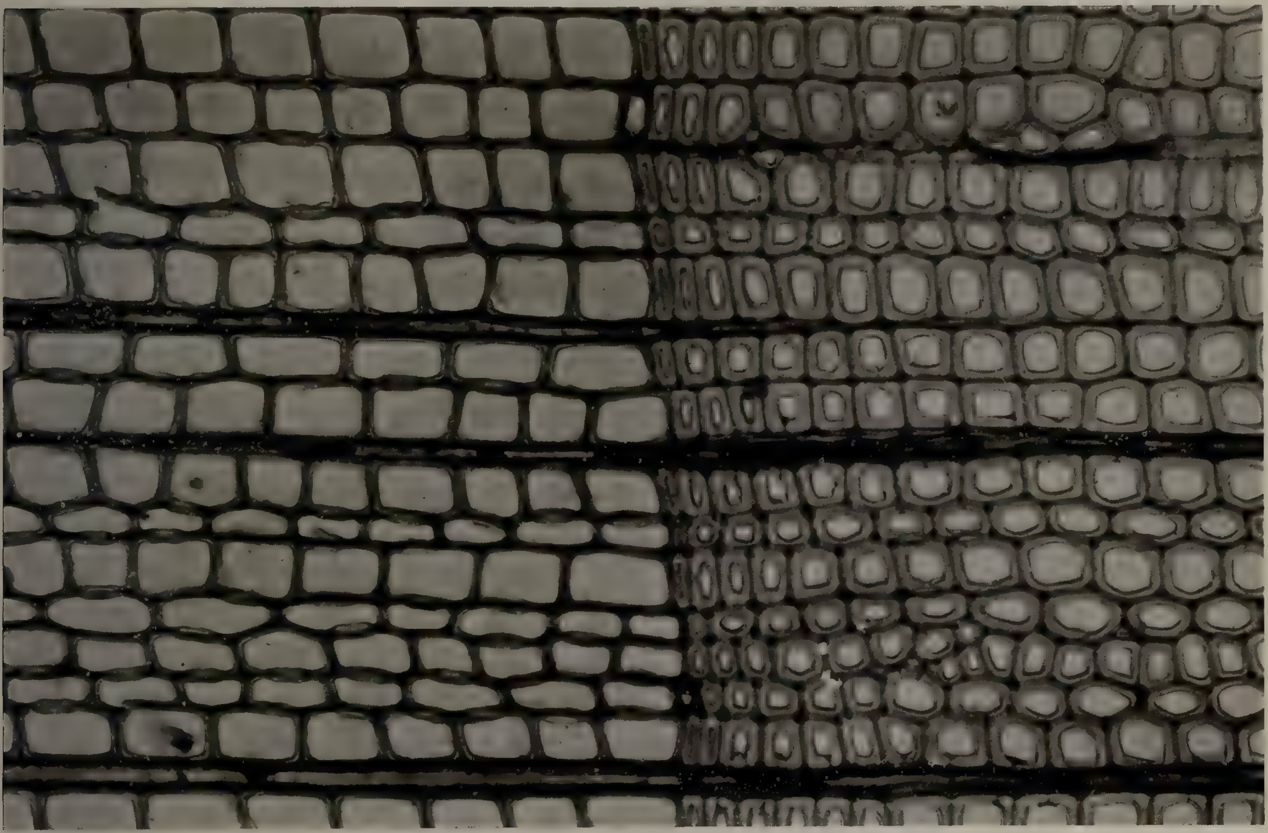
LAWSUIT SETTLED.

An action by the Ambursen Hydraulic Construction Company, Canada, Limited, Montreal, against the Dominion Paper Company, Quebec, has been settled by consent. The plaintiffs entered into a contract to construct a dam for a hydro-electric development on a 15 per cent. basis, but after two month's work were stopped, on the ground that the methods were too costly. The plaintiffs thereupon sued for breach of contract and for damages, and the defendants entered a counter-claim for a large amount. Under the settlement the Ambursen Company will receive $16,000 for commission and an agreed sum for damages, the counter-claim being withdrawn.

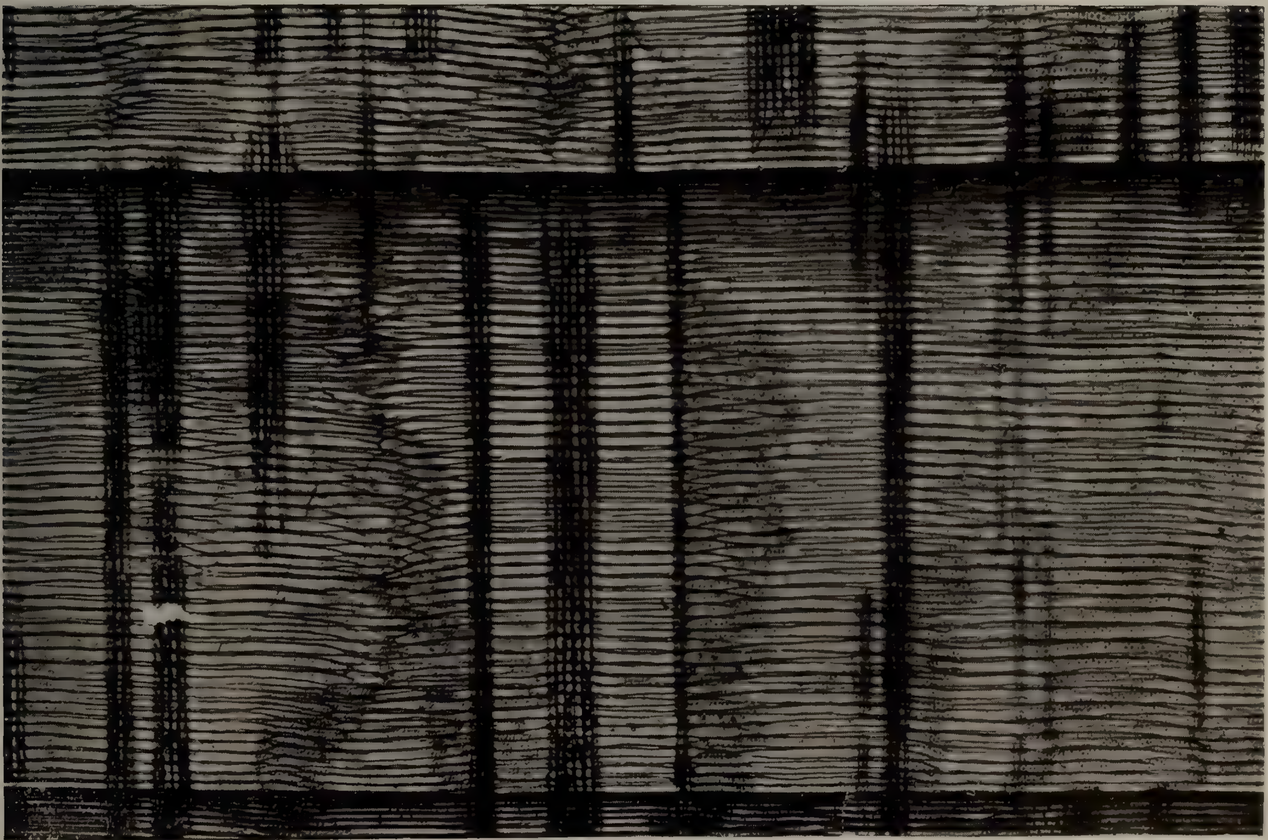
Micro. Photographs of Paper Making Woods---HEMLOCK.

Made under the direction of H. D. TIEMANS, U.S. Forest Products Laboratory, Madison, Wis.

(Continued from last issue)



TSUGA HETEROP LYLL A—Western Hemlock, X 250



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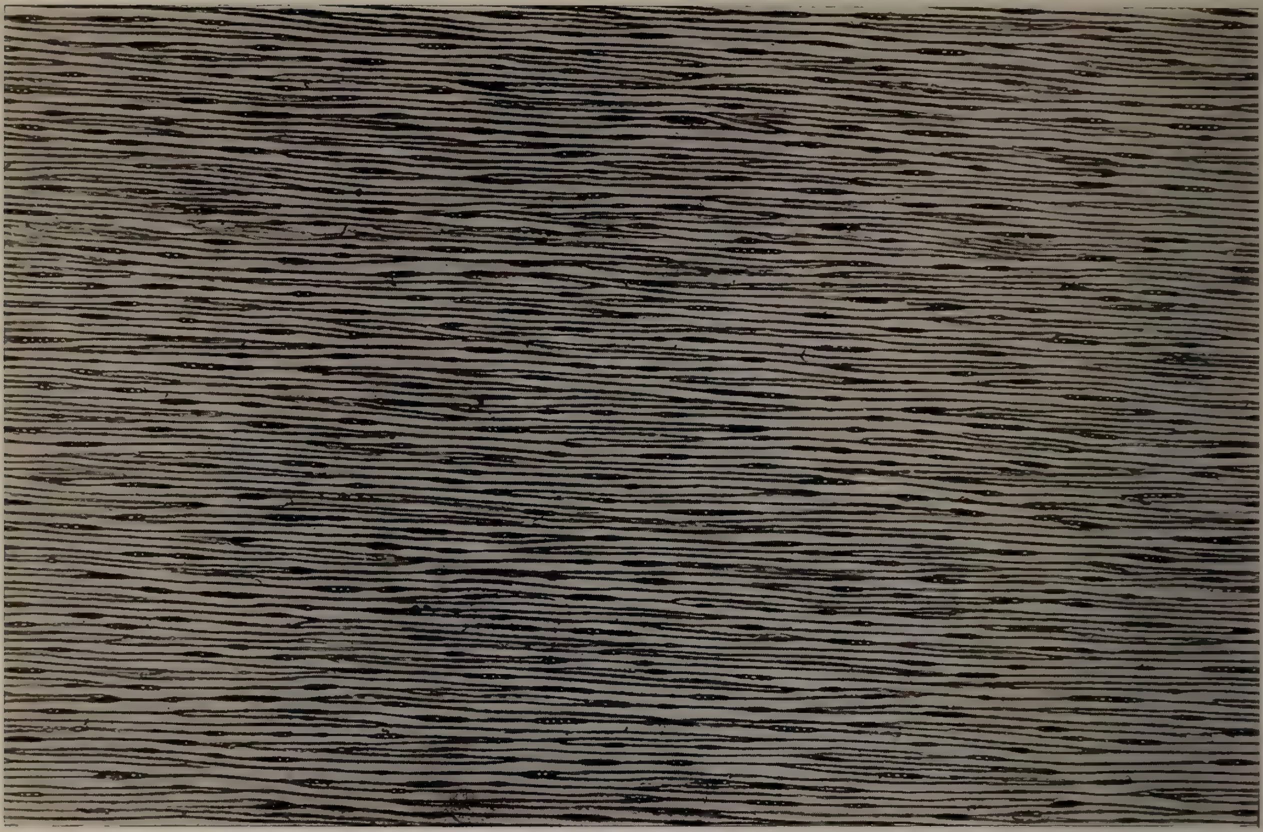

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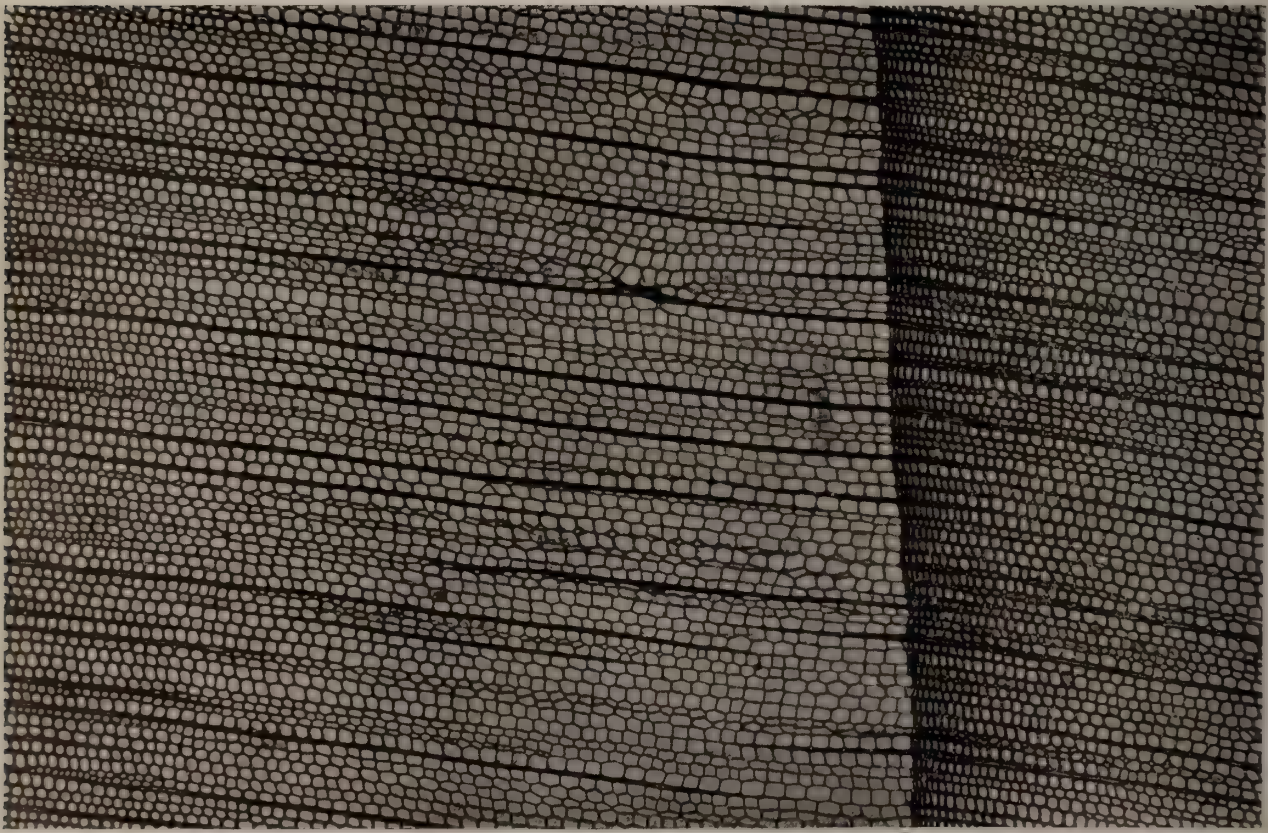

TSUGA CANADENSIS—Hemlock—Transverse X 50

THE LENGTH OF SOME PAPER MAKING FIBRES

By E. SUTERMEISTER.

THE importance of measurements of the length and width of paper-making fibres has recently been emphasized by Beadle and Stevens in an article in the "Paper Maker." This view has also been taken by C. D. Mell, who published in the "Paper Trade Journal," of June 15th, 1911, a long series of measurements of the fibres prepared from American coniferous woods. Little information relating to deciduous or broadleaved woods, is however, available and for this reason it is thought that the accompanying table may prove of interest.

All the measurements were made by means of a microscopic eye-piece micrometer which was carefully standardized by means of a stage micrometer. In each case a considerable number of fibres were measured, usually fifty or more though with some of the less important woods fewer measurements were made. The fibres were all prepared from known specimens and all were from trees large enough to be classed as of commercial size. Unfortunately no records were kept of the exact sizes or ages of the samples used except in a few specimens as noted below.

It is also to be noted that the measurements, while accurate for the samples examined, must not be understood to hold without exception for the same species throughout their ranges for it seems reasonable to suppose that the length of the fibres will be somewhat influenced by the rate of growth which in its turn is dependent on climate,soil, moisture, etc. It has also been proved by Sanio that in the case of pine the length of the fibres depends on the age of the wood and that this also holds true for poplar, and hence probably for other broadleaved woods, will be proved later.

The table below gives the maximum, minimum and average length and width of each kind of fibre studied and also the factor obtained by dividing the average length by the average width. This figure is considered as, in a way, indicative of the paper-making value of the wood since it is evident that a long but slender fibre would have greater felting power than one of the same length which is twice as broad. All measurements in the table are in millimeters, one millimeter being equal to approximately 0.039 inch.

Common Name	Scientific Name	Length			Width			L/W
		Max.	Min.	Avg.	Max.	Min.	Avg.	
*Largetooth aspen	Populus grandidentala	1.63	.51	.98	.043	.021	.029	33.8
Largetooth aspen	Populus grandidentala	1.62	.71	1.08	.044	.020	.028	38.6
Cottonwood	Populus deltoides	1.36	.58	.95	.029	.014	.021	45.2
*Aspen	Populus tremuloides	1.44	.50	.95	.036	.019	.026	36.5
†Aspen	Populus tremuloides	1.68	.78	1.15	.046	.020	.032	35.9
Balm of Gilead	Populus balsamifera	1.18	.38	.83	.044	.014	.028	29.7
White poplar	Populus alba	1.40	.50	.93	.034	.012	.020	46.5
Chestnut	Castanea dentata	1.13	.38	.79	.027	.009	.018	43.9
Beech	Fagus atropunicia	1.72	.70	1.13	.029	.015	.022	51.4
Cotton gum	Nyssa aquatica	2.67	1.24	1.85	.100	.028	.066	28.0
Sweet gum	Liquidambee Styraciflua	2.02	.96	1.55	....	....	.031	50.0
Black gum	Nyssa Sylvatica	2.32	1.18	1.68	....	....	.026	64.6
Red alder	Alnus oregona	1.77	.84	1.23	.038	.014	.027	45.5
Red maple	Acu rubrum	1.19	.67	.93	.028	.014	.020	46.5
Sycamore	Platanus occidentalis	2.21	.94	1.56	.033	.015	.024	65.0
Black willow	Salix nigra	.98	.55	.72	....	....	.024	30.0
Paper birch	Betula papyrifera	....	....	1.17	....	....	.205	46.8
Tulip tree	Liriodendron tulipifera	1.59	.64	1.14	....	....	.029	39.3
Cucumber tree	Magnolia acuminata	1.30	.55	.86	....	....	.029	29.6
Fraser umbrella	Magnolia fraseri	1.47	.62	1.08	....	....	.027	40.0
Yellow buckeye	Aesculus octandra	.92	.46	.62	....	....	.020	31.0
White elm	Ulmus Americana	1.98	1.00	1.35	....	....	.019	71.0

* Tree grown in Maine.
† Tree grown in Colorado.

The question of the relationship between the size or age of the tree and the length of the fibre was studied in the case of two logs of poplar 9-inch and 3-inch in diameter respectively. From the smaller log the fibres were isolated from two positions, the heart and the outside, while from the larger log samples were taken from the heart, the outside and at a point about midway between the two. The average length and width of fibres from these two sticks follow:

	Length	Width	L/W
3-inch log, heart	.49	.015	32.7
3-inch log, outside	.85	.018	47.2
9-inch log, heart	.75	.017	44.1
9-inch log, midway	1.00	.023	43.5
9-inch log, outsdei	1.09	.024	45.4

In a general way this confirms previous observations and proves that the fibres in deciduous woods do increase in length with the age of the tree. It does not show, however, whether this increase in length ceases at the end of forty-five years, as was proved by Sanio in the case of pine or whether it continues for a longer period.

This question is of some importance in considering the proposition to utilize the logging waste of tops and branches in the production of pulp, and leads to the conclusion that such material would yield a rather inferior product. It is also probable that some of the differences noted from time to time in the manufacture of paper may be due to the pulp being prepared at one time from small wood and at another from large logs.

Although a little apart from the main portion of this paper, yet the following measurements of fibers from cornnstalks may prove of interest because of the wide publicity recently given to investigations of this material as a source of paper pulp. The pulp from corn stalks contains a large variety of fibres and cells, many of which are difficult to describe; it may ,however, be roughly divided into the following classes: (1) long fibers, (2) short fibers, (3) serrated cells, (4) pith cells, (5) large cells with cross-markings and pores and (6) smooth cells with rounded ends. Following this classification the measurements made resulted as follows:

	Length			Width			L
	Max.	Min.	Avg.	Max.	Min.	Avg.	— W
Long fibre	6.40	.92	2.01	.085	.011	.0242	83.1
Short fibre	1.32	.26	.74	.023	.007	.0143	51.8
Serrated cells	.21	.057	.113	.071	.020	.0387	2.91
Pith cells	.23	.064	.129	.156	.043	.0951	1.35
Large cells with markings	1.39	.242	.630	.157	.030	.0984	6.40
Smooth cells	.51	.101	.267	.142	.028	.0576	4.64

In considering these figures, it must be remembered that there is no very sharp dividing line between some of the classes so that the division is a more or less arbitrary one. The table does, however, give some idea of the size of the fibres in comparison with those from woods as given above.

Making Boards on a Fourdrinier

In a translation from the "Wochenblatt fur Papier-fabrikation" published in "The World's Paper Trade Review," for June 13, a description is given of the maunfacture of boards on a fourdrinier without drying felts. In this way the cost of production of cheap qualities of board may be materially reduced and a softer, more absorbant and porous board is obtained. The character of the board will of course, depend first on the nature of the material and its treatment in the mill; the manipulation on the machine will also vary according to the quality. But all boards are required to lie flat, free from curling, with a smooth, uniform surface and to come evenly dried from the cylinders. This is easy when drying felts are used, but requires some attention when working without them.

The stuff must come on the wire with plenty of water, the wire must be long, and the shape strong. The water should be carried as far forward as possible and then drained quickly out just before the couch roll. For this purpose it is desirable to run the stuff a little warm, say at 95° to 100°F. For making boards of a thickness of one millimetre, without felts, a top wire is an absolute necessity. The top wire is given an effective travel in contact with the stuff for a distance of about eight feet, and is pressed against the web by means of three or four small rolls which are loaded with weights so as to give an increasing pressure as the web moves forward to the couch press. This arrangement gives a well closed even top surface to the board and insures a uniform draining.

With strong boards one or two suction boxes may be used, but they must not suck too strongly, otherwise the surface of the thick wet web will become uneven. Strong boards should be pressed up hard in the presses, while with soft boards the presses may be run light or even missed altogether. Free beaten boards are far more easily dried without felts than boards from wet milled stuff, and the latter, if not pressed as dry as possible, will tend to buckle and cockle on the cylinders, a tendency which is never experienced with freer stuff. When in the case of a soft board the web is allowed to miss the presses and to pass straight from the couchers to the cylinders, no wet felt is employed, but the heavy wet board is supported by a number of small wooden rollers about 2½ inches in diameter, arranged close together like the tube rolls which support the machine wire. They are arranged on an upwardly inclined plane leading from the couchers to the top of the first cylinder, where the board is gripped by a larger metal guide roll. This runs in spring bearings which press it with moderate pressure against the cylinder so that the wet board is held and drawn. Around the first cylinder are arranged two or three further adjustable pressing—on rolls, keeping the board against the surface of the cylinder and at the same time acting as smoothers.

In the case of very heavy boards it is advantageous to employ an endless band of cheap gauze arranged around the first cylinder only, after the manner of a drying felt. The gauze should be only moderately tensioned, serving only to support the board, not to press it. With heavy boards this guaze may be extended to enclose the small wooden supporting rollers mentioned above and help the board up the slope.

The use of wire cloth instead of felts has not proved satisfactory. The wires have a tendency to kink unless they are stretched very tight, they also show a tendency to leave a mark and work out much dearer than the gauze which is recommended. The other cylinders are used perfectly bare and are each provided with two pressing-on rolls for leading the board on and off. The pressing-on rolls of the earlier cylinders should be provided with doctors to keep them clean.

Considerable attention must be paid to the draw of the cylinders. Between the earlier cylinders also, carrying rolls will be required while the board is still wet in order to avoid breakages under its own weight.

Collodial Chemistry and Papermaking.

Writing in a recent number of "Wochenblatt fur Papierfabrikation," Professor P. Rohland of Stuttgart, states:

Between colloidal chemistry and paper-making, so many and such varied connections exist, that it seems remarkable that the fact should not have been recognized until within a recent period. But many troubles have been recognized of late that were not realized formerly, or only to a limited extent. For instance. paper-makers, have been greatly troubled of late by a notable hardening of river waters and subterranean streams, especially in neighborhoods where the water is contaminated by the refuse liquors of potash works. These waters contain exclusively salts, including a large proportion of magnesium chloride. Water thus hardened interferes with the sizing of paper, and must first be purified. The salts it contains act as electrolytes, and coagulate or throw down the sizing substances.

As a large proportion of electrolytes is injurious to sizing, the latter is rendered more effective by the presence of kaolin and talcs, by the latter especially, which are colloid promoting substances, that is, they form colloidal substances with water or hydrogen or hydroxyls, there being produced hydroxides of silicon, aluminium or magnesium; a flocculent separation of the substances occurs, in connection with an increase of volume, and in this condition the kaolins and talcs have the property of combining with the sizing substances, casein, starch, dextrin, etc., to form colloid aggregates.

As regards colloids, the general principle prevails that colloid substances unite with others of the same kind, to form colloidal aggregations. Not all kaolins have, in the same degree, the faculty of forming colloidal substances and of uniting with other colloids to form aggregations. Those are to be prepared, which in addition to great whiteness display a high degree of plasticity; for these, too, are conditional on the volume of colloid substances they contain.

The property of talcs for absorbing rosins, fats and oils, makes them well adapted for the deresination of cellulose. The talc suspended in hot water may be added to the cellulose boiler arranged for washing, or to the beater. The production of a talc suspension in hot water is advantageous, because, in this, by hydrolytic methods, a greater development of the colloidal bodies from the talc takes place. The talcs are excellent deresinating and degreasing media. They are likewise particularly suited for use as loading material, their adhesion to paper being very great. In moderately thick paper, 85% will remain in the paper substance, whereas of kaolin but 50% will be taken up.

On a colloidal chemistry basis, a point of difference between the various loading substances can be established. These may be either crystalloid substances, like heavy spar, gypsum, carbonate of magnesium, or substances of a colloidal character, such as kaolin and talc. The first-named have not the capacity for the absorption of coloring substances of a complex character, whereas the laltter do possess this. This investigation can best be conducted with aniline dyestuffs, aniline blue, for example, by which it is possible to establish a precise differentiation between both kinds of substances.

In addition to oils and fats, kaolin and talc, by reason of their colloid structure, absorb coloring substances of complex composition, both inorganic and organic in character; of the inorganic, for instance, Berlin blue, because this is of complex composition; also the long list of aniline colors, animal coloring substances like carmine, vegetable coloring substances like orseille, etc.

These absorptions are based on the following processes: Kaolin and talc, in an air dry condition, possess, to a certain extent, in a latent state, colloid substances and develope them in association with water. Thereby numerous demarcation and terminal surfaces are formed against the absorbing fluids that are the seat of superficial energy and in which surface expansion and capillarity are active.

If we desire to draw a picture of this absorption we can imagine that in the closely reticulate colloid tissue, the large molecules, complex in constitution, of the coloring substances, the fats, oils, etc., are absorbed, held back and retained. In connection with this is the notable light resistant character of talc and kaolin colors; the coloring substances enclosed in the small-cellular colloid tissue are surrounded by this as by a protective covering, so that the destructive effect of the rays of light is weakened and neutralized. This light-fastness is beneficial to the whiteness of the paper and protects it against yellowing.

These absorptions, which the author first discovered in talcs from Upper Austria, are of great importance in paper-making. Such talcs are almost perfectly pure, only, in them, the chemically fixed hydrogen is replaced by magnesium and aluminium. Their analysis showed the following composition:

$Si\ O_2$	61.85
$Mg\ O$	34.52
Al_2O_3	2.61
H_2O (Chemically combined)	0.60
Fe_2O_3	0.25
$Ca\ Co_3$	Traces

The colloid clays and talcs serve to purify the waste water from paper mills. These colloid clays absorb, in addition to colloid dissolved substances and coloring matter of complex composition from carbonates and acid carbonate salts, the anions completely and the same from borate salts, but only partially from phosphate salts. With this there occurs, simultaneously, an exchange of the alkalies of the solution for the earth alkalies in the clays.

Furthermore, these clays absorb strong odors and such as are offensive, proceeding from substances present in such minute quantities that they can not be quantitatively determined. It is remarkable that the flat, characteristic clay odor is communicated to the water solution, etc., in contact with the clay. Finally colloid clays take up from the water unsaturated carbohydrates of the composition: CnH_2nCnH_2n—2, wherein probably no absorption but a chemical fixation occurs.

The Canadian Handle Merger factory at Strathroy, was destroyed by fire last week with a loss of one hundred thousand dollars and throwing about one hundred men out of employment.

Utilization of the Wood-Substances Contained in Sulphite Waste Lyes as Fuel and Reclaiming of the Sulphurous Acid and Lime Used

By R. W. STREHLENERT

EVERY sulphite engineer probably since the beginning of the sulphite industry desires to be able to utilize the waste lye from the mill, which contains in solution more than one half of the weight of the wood.

Every sulphite engineer also knows very well, what valuable substances are eliminated during the digesting of the wood, and the problem of utilizing them as fuel for the mill evidently is close at hand. The most combustible contents, namely, rosin, oil, fat, lignine and miscellaneous carbo-hydrates, are substances, upon which the caloric effect of the wood to a ceratin degree depends. All this is eliminated as completely as possible during the digesting process, in order to obtain the cellulose of sufficient purity. These substances, which amount to 9%, or at the most 13% of the waste lye, are dissolved in a quantity of water of about 10 cubic meters (=2640 gallons) per ton cellulose. The easiest way to reclaim them seems to be by evaporating the lye, and numbers of patents have been applied for on methods and apparatuses for this purpose. It, however, remains a fact that about 9,000 litres of water have to evaporated before the dissolved substances are available.

The residue is a tough, viscous substance, which is difficult to handle and has only a low caloric effect, as it contains in different combinations, all the sulphir and lime in the acid. This evaporation process will be expensive even under most favorable circumstances. Many German sulphite mills, which on account of their location, some years ago, were obliged to make their waste lyes harmless, evaporated it, but could not stand the costs and must shut down.

Most of the many patents applied for are based on this very unsatisfactory and uneconomical system, always however, with the exception of some patents on methods to reclaim certain ingredients in the lye, which have had more or less success, and especially with the exception of the latest Swedish methods to utilize the fermentable carbohydrates for the manufacture of alcohol.

The author had a considerable experience in the sulphite industry before taking up this problem. He began his work without having studied the patent literature as he thought, that already known methods would lead him on along roads which it would later be difficult to abandon. He started with the intention, that the forces which should be used for solving the problem, ought to be looked for in the lye itself, and that as little outside forces as possible should be used.

In the lye exist, as we know, residues of free SO_2 and also combined. The last-named, the combined SO_2, is combined with the lignine from the wood. The quantity of SO_3 which may be at hand as sulphuric acid, is minimal in comparison with the combined SO_2. It was this circumstance that helped the author to solve his problem. He oxidizes the free SO_2 in the lye to SO_3, and the stronger acid thus formed, the sulphuric acid, drives out the weaker sulphurous acid from the lignine complex, or the so-called ligno-sulphinate of lime. This substance is soluble in water but the lignine is insoluble. Consequently the lignine must be precipitated, if the SO_2 is driven out of the combination.

In order to oxidize the free SO_2 in the lye, the author used a scientific fact, already well known, namely, that SO_2 under high pressure and at a temperature of about 170°C., in presence of oxygen or air is oxidized to SO_3.

The method and apparatus used for the first experiments was very simple; an autoclave constructed for a working pressure of 300 lbs., and compressed oxygen which could be admitted at any pressure. For the first experiment the author used by an happy accident sulphite lye from the Lilla Edets sulphite mill. This lye was obtained from digestion, where direct steam was used, i.e., from easily bleached pulp, and combined up to 14%to 15% of solid sunstances. The percentage of free SO_2 is only about0.01%, but experience has shown, that the organic substances are precipitated easier the higher the concentration is. This is, however, not to be regarded so, as if the facility, with which a precipitation is effected, is directly proportionate to the concentration of the lye; instead the rapidity of precipitation increases immensely more rapidly for a lye containing 1% more of dissolved organic substances. than for a lye with 1% less. The percentage of free SO_2 can also be very much lower.

Already the first cook gave an astonishing result. When the cover of the autoclave was lifted up, a solid, gelatinous mass was found. The lye was eliminated by means of a centrifuge, the substance was dried and weighed, and it was found, that 90 grams of solid substance had been obtained per litre of lye, corresponding to 900 kilo. per ton of manufactured pulp. The pressure used during the experiment was 300 lbs. and the temperature 190°C. Several cooks were used; all with equally satisfactory results. The author then experimented with lye from strong cellulose, i.e., cellulose cooked with indirect steam. The percentage of solid residue after evaporation of the lye was here considerably lower, about 10% to 10.6%. The percentage of free SO_2, however, was higher, about 0.1% or somewhat more. The temperature must be raised when cooking of this lye, 200° to 210°C. were used, and equally favorable results were obtained, even if a somewhat less solid substance remained. The time of cooking or rather breaking up varied between 40 minutes and one hour.

The author began to use air instead of oxygen after having comtinued the experiments daily for about two months. The result here was still better. The precipitated organic substance had not been so strongly attacked, or rather the formation of sulphuric acid was not so rapid, on account of which the final product was less charred. It was found, that the cooking easily could be handled so that a nearly pure, uncharred lignine substance could be obtained. In the practice it is possible under normal conditions to regulate the cook so, that a substance of desired qualities is obtained.

When the lignine substance, obtained during the first period of the experiments was tested for fuel purposes, it was found that the percentage of ashes was rather high. The lime salts, remaining in the substance were the cause. The author then tried to find a simple method to eliminate this and found sodium bisulphate very suitable. This salt is obtained as a by product from several chemical industries and is very cheap. The sulphite is added to the lye immediately after it leaves the digester, in quantities varying according to the percentage of lime in the lye, usually about 1½% to 2%. The reaction takes place nearly immediately. The lime is precipitated as gypsum and is substituted by soda in the lignine complex; i.e., a ligno-sulphinate of sodium is obtained, instead of the lime soda. The advantages are easily understood. The sodium salt, being soluble in water can be washed away after the precipitation of the lignine substance. An end-product with a very low percentage of ashes is thus obtained and the caloric value of the product is thus increased.

The following is a short description of the method of proceeding.

The hot lye from the sulphite digestor is precipitated with sodium-bisulphate; the gypsum which is precipitated, is given time to settle and the clear solution is run into the autoclave. The gypsum is washed in a centrifuge and is ready as a merchandise after drying. The autoclave, filled six tenths full with precipitated lye, is closed and heated to 100°C. Air is then pressed in to a pressure of about 285 lbs. A reaction temperature of about 20°C. is noticed during this period. The heat is then slowly increased until a temperature of about 160° has been reached. The SO_2 was then found to be oxidized up. The critical temperature or the point where the lignine substance begins to become disassociated, is between 160° and 170°. The heating can then be very considerably forced, and an addition of heat from the chemical reaction of about 20°C. will be noticed also here.

The cook is ready, when 200° or somewhat more has been reached, which for a normal cook, ought to be 40 to 60 minutes after the temperature in the digester has been found to be 100°. The following is, however, to be remarked. When the critical tenperature is reached, i.e., when the dissassociation begins, the pressure increases so rapidly in the digester, that a blow off valve on the autoclave cover must be opened. Most of the free SO_2 is thus let out, which can be collected and used again. The addition of temperature which has been obtained in this autoclave is utilized by blowing into a second autoclave, which thus always must work alternately with the first. A weak current of air is blown through the lye during the second moment of the heating up period. This has been found indispensable in order to get a precipitate of an easily treatable consistence. The precipitate becomes somewhat gelatinous with too little air, and with too much air it is oxidized too sharply; an average is, however, easy to find here. The excess of air pressed into the first autoclave, is conducted to the second and thus nothing is lost. The cover of the first autoclave is opened and the mass emptied out, when the temperature in No. 1 has been reduced to about 100° and consequently, there is no pressure. A precipitate of a sandy character is obtained which easily can be washed free from excess of water in a centrifuge, provided that every thing has been right during the heating up period and that enough air has been blown through.

A correctly treated precipitate is easily freed from an excess of water in a few minutes in a centrifuge to at least 50% dryness.

The product can then easily be dried to any desired degree of dryness. The dry product has a caloric effect of about 7,000 calories calculated in substance free from ashes. The percentage of ashes can, as above stated, be reduced to an exceedingly small percentage of the weight of the raw material. At least 30% of water ought always to be left in the substance, partly because it burns too vehemently if completely dry and party because it then leaves considerable as dust.

Preparation of Caustic Soda from Silicate of Soda

Many attenpts have been made to prepare caustic soda from water-glass by the action of lime, but the difficulty has always been that the silicate of lime also formed is in the gelatinous form, and so entangles the caustic soda that it is impossible to laxiviate it out.

The only way hitherto known of combating this difficulty has been to dry the whole mass after the re-action. This operation has two very serious drawbacks, either of which is fatal. One is the expense for fuel, the other is that unless the greatest care is taken in the drying, especially to do it very slowly and at the lowest possible temperature, an insoluble glass will be formed, consisting of a double silicate of lime and soda, from which no soda can be dissolved out.

M. L. P. Basset claims to have discovered that if the mass of gelatinous silicate of lime and caustic soda is simply left to stand for twenty-four hours after the reaction, the silicate becomes non-gelatinous, and the soda can then be easily dissolved out. The silicate of soda is taken at about 30° B. strength, and mixed with quicklime. Slaked lime may be used,b ut then the silicate must be stronger, say, 45° to 50° B. It is, however, much better to use quicklime and the less concentrated silicate.

The best method of preparing the silicate of soda for the purpose of making caustic soda is to pass steam over a red hot mixture of sand and common salt. The amount of sand required per 100 pounds of salt depends on the fineness of the sand, being less as that is greater. If the sand is ground as fine as flour, from 60 to 80 pounds of it will be enough. If the sand is coarser, as much as 200 pounds may be wanted.

The furnace used is a rotating one, heated internally by burning a spray of oil or coal dust. The silicate of soda formed is not vitrified unless the temperature has exceeded 900° C., but in any case it dissolves in water with the greatest possible facility and speed. The hydrochloric acid formed in the preparation of the waterglass is condensed in a tower of the usual construction.

The Paper and Pulp Industries in Russia.

By C. E. BANDELIN.

The demand for paper in the world's market has risen immensely during the last ten years and the paper industry has consequently been intensely developed. The times are long ago gone, when the main raw material for the manufacture of paper consisted of rags. At the present time nearly exclusively wood-pulp is used, except in Russia, where notwithstanding the great resources of wood, none or at least a very slow development in the wood pulp industry can be perceived. During the last fifty years there have been built in that country: 1860 to 1869, six mills; 1870 to 1879, twelve mills; 1880 to 1889, eighteen mills; 1890 to 1899, twenty-nine mills; 1900 to 1910, seven mills.

This is, however, erroneous in so far as the last seven mills are very large and also because several of the already existing mills have afterwards been enlarged, but it is still evident, that the paper industry is only slowly being developed in Russia. This industry ought, however, to be especially lucrative in Russia with its rich resources of raw material. This can, however, now not be said to be the case, as according to a report of 1910, the average income for twenty-seven mills was given as only 4%. The reason is to be found mostly in deficient planning of the establishment and faulty calculations, old machinery and competition with the rich Finnish resources in paper and pulp. The raw material has up till now been rags. and wood-pulp has just lately been brought in the market, so it can be said, that the manufacture of paper from it is only recent and consequently has not as yet been much developed, especially with regard to the chemical pulp.

It seems as if the building of paper mills ought to be natural in regions where there is plenty of wood, especially in the provinces of archangelsk, Olonetz and Wologda, where the area of forests belonging to the government amounts to about 163,000,000 acres, and where, especially as in the Olonetz district, also waterpower is at hand, even if the head is not very high. Mills occur, however, only occasionally in these provinces on account of the distances being too great and on account of the lack of communications. This is the reason, that there are mills in such provinces as Orel and Tchernigoff, where there is little wood, but where the communications are better. The lack of mills in the wooded provinces depends not only upon this, but also upon the competition with Finland and further upon lack of enterprize. The new mills built are also usually financed by foreigners.

One reason for the slight developments of the paper industry in the wooded districts may be found in the circumstance that the government owns 80 to 90% of the forests in the provinces mentioned, while in other provinces, as for instance in Livonia, about 85% are owned by commonaltics or private owners. One reason is also, that the Russian paper-mills usually are built too small to stand the general expenses.

It is mainly two concerns in Russia, Waldhof in Pernau and Sokol in Wologda, which dominate the paper market.

The numbers of wood-pulp mills in Russia is only about seventy. The mills are mostly located in the northern and western provinces. The greatest number, twelve, are in Livonia, and secondly in the provinces of Novgorod and Volhynia. The number of mills making only wood-pulp is about twenty with an average production per year in the value of about $2,000,000 and with about 2,500 laborers.

About 20,000 tons of cardboard are made in twenty-six mills. About 60% of the Russian cardboard and paper is made of foreign pulp. There ought to be more than 100 mills and many thousands of laborers, if the paper pulp was made in Russia. On the other hand Russia exports considerable quantities of pulp-wood and this export is steadily increasing.

The following data may be given regarding different grades of paper:

Coarse papers, wrapping paper (usually rather coarse), is mostly made in the country.

Fine writing paper comes from France or Germany; copying paper is usually of domestic manufacture.

Colored, thin papers come from Austria. Paper for type-writers comes from Germany. Letter paper and envelopes are domestic, but better grades come from foreign countries.

View cards come from Germany and Sweden. Cigarette or papyross paper is isually made in Russian mills. The consumption is considerable, but the public makes their cigarettes themselves and uses often for this purpose, newspaper or any old kind of paper.

Finland exports considerable quantities of cigarette paper as well as wall paper.

The import to Russia is increasing: 50,000 tons valued at $6,500,000 were imported in 1905; 64,000 tons, valued at $8,000,000, in 1906; 76,000 tons, valued at $8,500,000, in 1907; 80,000 tons, valued at $8,500,000, in 1908; 82,000 tons, valued at $10,000,000, in 1909 and 100,000, valued at $12,000,000, in 1910.

Most of the import of course, comes from Finland. The Finish import was: 1907, $6,500,000; 1908, $7,000,000; 1909, $8,500,000; 1910, $9,500,000.

Cardboard, wrapping paper and roofing board especially are imported from Finland in an increasing ratio.

The import of paper from other countries is also increasing.

Russia exports cellulose and rags. The export of cellulose however, is not very considerable and is nearly stagnant. Russia exports unbleached cellulose and imports bleached. The price for both is falling. In 1910, 0.87 rubles per pud was paid for export pulp and 1.50 rubles for import pulp, this on account of improved methods and the general developments of the industry.

A meeting of the hemlock lumbermen of Ontario was held in Toronto last week at which H.H. Carter presided. It was decided to draw the attention of the Ontario government to the vast importation of southern pine which is being made into Canada at the present time and the government will be asked to use the Canadian wood exclusively on public works. It was declared that even the cutting and storing of this imported wood was inferior to the local growth and that Canadian hemlock, which had been in use for over sixty years, was in first class condition today.

UNITED STATES NOTES

(Special to Pulp and Paper Magazine.)

The Racquette River Paper Company of Potsdam, N. Y., was the host at a banquet given to thirty-two of its employees at Arlington, N.Y., on Saturday evening, January 3rd. The affair was in the nature of a New Year testimonial, and may be repeated next year. Those present included the officers and the various department leaders, together with Arthur C. Hastings, president of the American Paper and Pulp Association as guest of honor. Mr. Hastings made an impromptu address and spoke on the general state of the industry, and in particular of the foreigners' application of science to the paper business. He concluded by explaining this country's conservation of its natural resources which are such important factors in the pulp and paper industries.

* * * *

Information has been received in Northern New York that the Donnacona Paper Company, Ltd., the new concern in which a number of business men in that section are interested, will probably be in operation next month. As the originators of this proposition are men of large affairs,and have been able to carry their operations forward without the general sale of securities to the public, little has been made public of their intentions. It is understood, however, that they have obtained large blocks of lumber in Canada, and have built their mill on a very favorable site on the St. Lawrence River. The underlying feature of the proposition is that with the diminishing supply of lumber in this country, and particularly in Northern New York, it is advisable to anticipate by a few years the natural results of such a process, and by being forehanded in placing their mill next to the actual supplies, and to reap the benefits accordingly.

* * * *

Manufacturers and publishers have gone to extremes in adopting light weight printing paper for their publications, asserts the Department of Agriculture at Washington through its leather and paper laboratory. In a statement just issued, the Department warns against the use of light limp paper in publications which are consulted very ferquently, as it is unsuitable for the purposes for which it is employed, and wears out much too fast.

* * * *

After twenty three years of service, William Brown, of Glens Falls, N.Y., has resigned as foreman for the International Paper Company, to accept a place as assistant superintendent of a mill owned by the News, Pulp and Paper Company, Ltd., in St. Raymond, Canada. This mill is said to be one of the largest in North America. Mr. Brown entered the employment of the International Paper Company as a paper-maker and gradually rose to machine tender and then foreman.

* * * *

F. L. Holt has resigned his position as superintendent of No. 1 Mill of the Nashua Gummed and Coated Paper Company, of Nashua, N.H., to enter business for himself in the West. Mr. Holt has been identified with the company for the past ten years. His resignation is effective February 1.

* * * *

The Hallingworth and Whitney paper mills at Winslow, Me., are constructing an acid tower and making an addition to the sulphite mill. Horace P. Winston Company, of Waterville, are the contractors. The work will be completed in March when it will be necessary to add 125 men to the working force.

* * * *

The Strathmore Paper Company has completed sit new $500,000 mill at Woronoco, Mass. The structure is built on the unit plan and is of reinforced concrete. Power for the mill will be furnished by the hydro-electric station on the Westfield River and from a nearby steam plant. The Company has also erected seventeen houses which have tenements for fifty-three families.

* * * *

It is understood that the Plainville Paper Box Company, of Hartford, Ct., will shortly ask for receivership proceedings so as to wind up the company's affairs. They have been closed by attachment for sometime and it is thought they will discontinue business. As soon as the affairs of the Company are straightened out, Mamager John Lyon will leave the city, as he has received several very remunerative offers elsewhere.

* * * *

The Whitaker Paper Company, of Cincinnati, Ohio, held its tenth anniversary sales meeting several weeks ago. On this occasion addresses were made on all subjects of interest to the trade by the managers of the various departments. Representatives from each of the company's sixty-five branch houses were in attendance. The committee in charge of the affair were: A. L. Whitaker, president; D. E. Barry, vice-president; H. Junginger, Jr., treasurer; and H. P. Warrener, secretary and general manager.

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Following the lead of the International Paper Company in the east, it is stated that a number of the Western manufacturers of newsprint paper have decided to materially reduce the production of news in Wisconsin, Michigan and Minnesota during 1914. Most of the manufacturers, it is said, will switch to other grades as far as busines will permit. Canadian competition is given as the chief reason for the news manufactureres in this country leaving the field. Low prices following in the wake of the heavy competition from across the international border, made possible by the Canadian reciprocity act, is evidently driving American mills out of the newsprint market.

* * * *

Fire in the heart of the business district on January 6th in Philadelphia, Pa., swept the five-story envelope factory of Charles J. Cohen &

Sons, Fifth and Ludlow Streets, entailing a damage of $100,000 and causing serious injury to four firemen. The fire was probably raging for some time before it was discovered, as it was concealed by the exhaust of a near by power house.

* * * *

Assistant secretary of the Treasurer Hawlin, at Washington, on January 6th, wrote the Collector of the Port of New York as follows, regarding the proper classification of wrapping paper:

"The Department is in receipt of your letter of the 9th ultimo., presenting for consideration and decision the question whether wrapping paper with a surface design is dutiable under paragraph 324 at the rate of 35 per cent. ad valorem, which paragraph provides that rate of duty upon papers with the surface or surfaces wholly or partly decorated or covered with a design, fancy effect, pattern or character, whether produced in the pulp or otherwise, or under paragraph 328 of the said act at the rate of 25 per cent. ad valorem, which paragraph provides that rate upon wrapping paper not otherwise especially provided for.

"The United States Court of Customs Appeals in T. D. 33,221, held that certain merchandise invoiced as 'white glace wrapping paper,' imported under the tariff act of 1909 and which the appraiser reported consisted of 'super-calendered, grease-proof paper, known as glassine, or parchmyn paper,' was properly dutiable under paragraph 411 of the said act at the rate of 2 cents per pound and 10 per centum ad valorem, and not as claimed by the importers under paragraph 415 of the said act as 'wrapping paper not specially provided for.'

"That portion of paragraph 411 under which the court held the papers dutiable provided for parchment papers and grease-proof and imitation parchment papers which have been super-calendered and rendered transparent or partially so by whatever name known.

"The court in this decision stated that the specific enumeration in paragraph 411 took precedence over the general classification of wrapping paper not specifically provided for in paragraph 415, and following the reasoning of the court the Department is of the opinion that the provision in paragraph 324 for papers with surface or surfaces wholly or partly decorated or covered with a design, fancy effect, pattern, or character, whether produced in the pulp or otherwise, is more specific than the provision in paragraph 328 for wrapping paper 'not specially provided for,' You are accordingly directed to classify merchandise of this character under paragraph 324 leaving for the importers if dissatisfied their remedy by protest."

* * * *

The purchase of the Ocean Falls Pulp & Paper Company by a San Francisco Syndicate, headed by William Pierce Johnson and Herbert and Mortimer Fleishhacker has been announced. The Ocean Falls Company is to be reorganized, and it is proposed to combine the chief pulp and paper interests on the Pacific Coast on both sides of the international boundary line. The proposed amalgamation will unite the Ocean Falls Company with the Powell River Pulp & Paper Company of British Columbia, now in operation, the Crown Paper Company of Portland and Quatsino Sound Pulp Company.

* * * *

The pulp Sulphite and Paper Mill Workers' Union at Little Falls, N.Y., has elected the following officers: President, J. Murphy; vice-president, Philip Kuss; treasurer, M. Daley; financial secretary, C. W. Bennett; recording secretary, D. McCombs; guide Daniel Sedgwick; trustees, L. Linehan, Clayton Philo and Fred Reynolds.

* * * *

The industries of Skowhegan, Maine have acquired a new kind of a factory, the manufacture of paper in the finished product from the waste of woolen mills, old papers, old rags and many other kinds of waste materials. This business is now being carried on by the Savage Manufacturing Company and twenty-six hands are at present employed for the work. The mill was started by E. L. Savage as a ground pulp mill and the present product makes the mill making fourteen grades and comtemplates making more. His plans are to triple his present output and orders demand it as soon as he can get the machinery being made for him. The paper he now makes is used largely in the manufacture of pasteboard boxes.

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Logan Thompson, son of Peter G. Thompson, President of the Champion Coated Paper Company, Hamilton, Ohio, narrowly missed being struck by a large piece of iron several weeks ago when workers dynamited the wreckage of the Black Street Bridge, at present imbedded in the Miami River, having been wrecked by the flood. The iron flew across the channel and into the office of Mr. Thompson, striking his chair.

* * * *

Orin Earl, of the firm of Earl Brothers, loggers of Peshtigo, Wis, says that conditions are quite unfavorable for logging owing to lack of snow. He declares that some of the pulp companies whose plants are entirely out of raw stock have issued orders to their crews in the woods that unless snow occurs at a very early date wagons must be employed for hauling logs. They simply must have pulpwood especially spruce, and if sleighs can not be used, loggers must resort to the more expensive method and haul the wood on wagons to railroad sidings. Inasmuch as from two to four weeks of the normal season in the woods is already passed it is plain to be seen where at best the output is bound to be small this year. Not in many years have pulp mill yards been as depleted as they are at the present time.

Secretary of War Lindley M. Garrison, as a stockholder of the St. Ganriel Lumber Company of Canada, lost on January 3rd, by a decision of Supreme Court Justice Davis in New York City, a suit against Howard W. Durant and the banking firm of Sheldon & Co., to recover 67,000 dollars. Durant was alleged to have received the money as a secret commission from the Sheldon firm and the Union Bag and Paper Company on the sale of assets of the St. Gabriel Lumber Company to the Union Bag and Paper Company.

Secretary Garrison testified at the trial that he went into the lumber business with Durant in Canada, in 1902, and that in 1908, because of the failure of the Soverign Bank of Canada which held liens of the St. Gabriel Lumber to the extent of $100,000, the lumber company was on the verge of insolvency. Durant then suggested that the company sell out to the Union Bag and Paper Company. Secretary Garrison and other stockholders contended that Durant made a secret profit of $67,000 on the deal.

Ottawa Notes.

(Special to the Pulp and Paper Magazine.)

Ottawa, Ont., Jan. 12th, 1914.

The new sulphite mill being built by the J.R. Booth Company as an addition to its present plant for the production of sulphite pulp is fairly well advanced toward completion. The machinery will all be in within the next month and it should be ready for operation in February or March.

The new groundwood mill which the E. B. Eddy Company recently finished will also be operating at full capacity by February. Men are now at work on the power plant of the Company, which is being rearranged to increase the power supply.

The Railway Commission yesterday gave judgment refusing the application of the Howell Company of Toronto, protesting against the increase in freight rates on import wood pulp to various points on the C. P. R., G. R. T. and Canadian Northern. It was stated that in 1912, the C. P. R. and the Canadian Northern had a rate of 6 cents per 100 pounds on this commodity, in carloads, from Montreal to Shawinigan Falls while as the same time the C. P. R. rate to Grandmere, Joliette and Lachute was 8 cents per 100 pounds. To Kingsey Station and Windsor Mills, the Grand Trunk rate was 9 cents. As a result of the negotiations between the applicant and the railways, the C. P. R. rates to the points mentioned were reduced to 6 cents per 100 pounds while the Grand Trunk reduced its rate to Windsor Mills and Kingsey Station to 7 cents. The railways gave notice these rates were limited to 1912 and later restored the rate to 8 cents to Shawinigan Falls.

The two companies most vitally concerned in the application were the Belgo-Canadian Pulp and Paper Company at Shawiningan Falls, and the Canada Paper Company at Windsor Mills, to both of which the Howell Company sells sulphite pulp. In its judgment the Railway Commission states that consideration of the tariffs on wood in force between other points on the Grand Trunk shows that they are not worked out on a mileage basis, as is indicated by the following rate comparisons:

	Miles	Min. 40,000 lbs.
Danville to Cornwall	154	8 cents
Ottawa to Brompton Falls	208	8 cents
Merritton to Georgetown	61	6 cents
Hawkesbury to Cornwall	67	6 cents
Merritton to Thorold	69	6 cents
Campbellford to Toronto	125	7 cents
Ottawa to Mille Roches	113	6 cents

The judgment also points out that it is shown in a statement submitted by the Grand Trunk that there are at Montreal special charges amounting to about 2½ cents per 100 pounds, as follows: handling, 30 cents per ton; rail carriers' proportion of wharfage, 3 cents per ton; Montreal Harbor Commissioner's switching, $2.50 per car, 17 cents per ton, making a total charge at Montreal terminals of 50 cents per ton. It concludes: "Comparing the rate as charged with the rates of the local product and taking into consideration the mileage involved and the charges which have to be borne at Montreal on the imported product as compared with the movement on the local product, the Board is of opinion that 8 cents is a reasonable rate for the movement from Montreal to Windsor Mills."

A fact that has been widely commented on has been the fact that out of six Canadians who figure in the New Year's honor list from London, announced on the first day of the year as usual, no less than four of them are men who have either been engaged in the actual manufacture of timber into its various products or have been associated at one time with the industry in a legislative capacity.

Henry K. Egan and Hon. Lt-Col. Sir Douglas Cameron are the two lumbermen honored. Mr. Egan, hereafter to be known as Sir Henry Egan, is an Ottawan and is managing director of the Hawkesbury Lumber Company. Sir Douglas Cameron, who is accorded a K.C.M.G., is lieutenant-governor of Manitoba and is known to the lumber trade as president and general manager of the Rat Portage Lumber Company which has mills at Kenora, Norman and Rainy River, Ont., Winnipeg and Vancouver. Besides these men, Sir Francis Langelier, lieutenant-governor of Quebec and formerly known to lumbermen as minister of Crown Lands for the same province, is also a K.C.M.G. while Mr. Aubrey White, formerly engaged in the lumber business in Muskoka and at present deputy minister of lands and forests for Ontario, is made a C.M.G.

A question of considerable interest to both Canadian and United States lumbermen and paper mill owners will be discussed in Parliament during the coming session—that of the pollution of international streams. A commission appointed to investigate this question has prepared its report which will show, it is understood, serious pollution of various international streams along the boundary. The carrying on of lumber operations and the discharge from paper mills are among the sources of pollution dealt with in the report, it is understood.

An order-in-council has been passed by the Cabinet along the lines of the recently announced policy of the Government with regard to water powers on Dominion lands. The order-in-council amends the regulations governing the granting of yearly licenses and permits to cut timber on Dominion lands in Manitoba, Saskatchewan, Alberta, the Northwest Territories and certain portions of British Columbia so as to provide for the withdrawl from timber berths held under license, of lands required for waterpower purposes on the condition that the lessee of the waterpower will pay the licensee of the berth the value of timber of ten inches and over, in diameter at the stump on the tract withdrawn, the value of the timber in case of dispute to be fixed by the Minister of Interior.

Final settlement of the cartage question makes it apparent that while shippers in Montreal and Toronto will hereafter have to pay 4 cents per hundred pounds those in Ottawa in common with London and other smaller cities, will be taxed only 3 cents per hundred pounds, which is what they have been paying since the first increase in October last.

Provision for the grazing of livestock on reserves containing grass land areas is made in new regulations governing Dominion forest reserves which have gone into force. They are modeled on those of the United States and will make available to the Dominion forest service a source of revenue second only to that derived from the management of the timber on those reserves, it is expected. The minimum dues for cattle and horses will be five cents per head per month and the maximum 10 cents. Sheep will be grazed at one-quarter this charge.

A bulletin of the Conservation Commission issued last week states that a total of sixteen prefessionally trained foresters are now employed by the Quebec Forester Service and that there were fourteen parties in the field last summer valuing unlicensed Crown timber lands. It was estimated that there were approximately 125,000 square miles of such lands in Quebec Province while the Crown Lands under licenses aggregate 70,000 square miles, producing a revenue of about $1,750,000.

Free lumber and lower freight rates on lumber and paper were among the requests made by a deputation representing the Western Grain Growers and the Dominion Grange which waited on Premier Borden and the members of his cabinet last week in regard to tariff changes which a large section of the agricultural population of the West desire. The deputation also asked that action be taken in regard to ocean freight rates. Although consideration only was promised by Premier Borden, it is known the requests as to rates are viewed favorably by the Government. As to the lowering of tariffs on lumber, however, which the Western people desire in order to allow the importation of lumber from the United States to the prairie provinces, there will be considerable difference of opinion and—if the issue is raised—considerable opposition.

Of considerable interest to the trade is a report on the water power potentialities of Manitoba which has been completed by the waterpower branch of the Interior Department. The report has been forwarded to Judge Robson of Winnipeg, utility commissioner of Manitoba, who is now engaged in preparing a report to the Provincial Government in connection with the question of development of water powers within that province with a view to the inauguration of a hydro-electric commission something similar to that of Ontario. It is stated in the report that power possibilities of the smaller rivers of the Province are limited and of local importance only. The main sources of dependable power in commercial quantities are the Winnipeg River, the Grand Rapids and the Saskatchewan River and the large rivers of the North including the Nelson, the Churchill and the Berens. The Winnipeg River is found to be one of the most notable power rivers on this continent. Its flowage can be so regulated as to be practically uniform throughout the year and it has power possibilities of 400,000 horse power development.

Claims dating back twenty-five years ago and involving timber and pulpwood areas of considerable extent were considered at a conference recently, between the Minister of the Interior and Hon. W. H. Hearst, Minister of Lands, Forests and Mines for Ontario. The claims had their origin at the time when considerable territory was added to Ontario by the old boundary award and relate to compensation to the province for certain lands taken for Indian reserves. It was announced at the conclusion of the conference that a basis of settlement had been reached.

ROSIN TROUBLES ON PAPER MACHINE.

The clogging of press rolls with rosin, rosin spots in the wire, etc., in chemical and ground wood papers and papers glazed on one side are among the most troublesome things I have encountered in many years' practice, states a writer in the "Wochenblatt," who says he has noted these disturbing conditions in different mills to an extremely varying extent. Whereas one plant will suffer badly from them, and another less, there are also mills where nothing whatever is known of them. He says he was in a mill that produced its own cellulose, with a small outfit. A great deal had to be produced so that the boiling was quick and sharp; and they were never free from rosin troubles. In another mill, where the chemical fibre was purchased, rosin gumming occurred only occasionally; in a third, where only good quality cellulose was used, rosin troubles never occurred. He attributes this to the use by the first mill of a cellulose that was not perfectly digested. The thick, coarse fibers retain the rosin which is softened and changed by the boiling process and acquires more the properties of pitch, and does not release it in the washing, whereas well boiled and disintegrated cellulose, during the washing, is entirely freed from rosin which, owing to the longer boiling process, is completely dissolved in the lye.

To the rosin in the cellulose, the rosin or pitch spots on the machine wire are mainly due. Most papermakers will know how injurious such a clogged wire will be to the quality and appearance of a paper and how tedious and troublesome is the process of cleaning the wire from the coarser spots at least. Of course, a badly disintegrated cellulose will not felt so closely as one that is thoroughly disintegrated, because its fibres are coarser and stiffer. This makes itself disagreeably evident in the production of newsprint paper on quick runs, in the sticking and tearing of the paper sheet. It is ultimately necessary to increase the proportion of chemical pulp, but finally, with a thirty per cent. charge, the results obtained are not as good as with twenty per cent of a sound, well digested pulp.

The ground wood, too, sometimes contains rosin. As, however, it has been subjected to no boiling process, the rosin is more finely distributed. It is not a pitchy rosin and consequently no rosin spots are formed in the wire; on the contrary, a dry and gritty mass may be noted on the doctor of the first press roll. If the woodpulp has been coarsely ground, it is better for it to remain so than to be ground down in the finishing machine for the "dead" or beaten particles produce patches on the machine, it also sticks to the press rolls and finally, working rapidly, it is not possible to produce a good close paper, but there will be thin patches on it. That which has been ground down on a sharp stone, is and will remain "free," no matter how fine it may be ground in the jordan. For this reason, the main point in woodpulp production is centered in the grinding process.

If the sulphite pulp is perfectly digested and the ground wood is not too coarse and short, and if the sizing is properly prepared and is not added to the beater until after beating and before alum in sufficient quantities is added, there will be no rosin troubles on the paper machine; of course, other causes may produce spots in the wire—for instance if lubricant from the bearings gets into the pulp; but then the raw material can not be regarded as responsible.

BRITISH TRADE NEWS

SPECIAL TO PULP & PAPER MAGAZINE

London, Jan. 1st, 1914.

At the ordinary general meeting of the Amalgamated Press, Ltd., held in London, Mr. George A. Sutton, vice-president, made a reference to the subsidiary companies under their control. He said that what he might call the manufacturing side of their business was an extremely valuable asset and he might mention the Imperial Paper Mills, Ltd., the Anglo-Newfoundland Development Company, Ltd., and the Empire Printing Ink Company, Ltd., were doing well. During the year the Imperial Paper Mills, Ltd., and the Empire Printing Ink Company, Ltd., had added to the profits of the company, and, as he mentioned he hoped that the company will eventually receive large profits from these subsidiary companies. As was pointed out last year, the Imperial Paper Mills, at Gravesend, are quite the most up-to-date paper mills in the United Kingdom, in addition to being the second largest. At Gravesend, they had eight of the most modern machines in paper-making now in operation and a further two were in course of construction and will be running next year. The magnificent site upon which the mills were erected, covers an area of some 49 acres, the freehold of which belonged to the company. The Anglo-Newfoundland Development Company, Ltd., continues to make steady progress, as may be seen from the issue of the last balance-sheet, which showed a considerable increase in profits on the previous year's trading.

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M. F. W. Dobson, of the Kettlebrook paper mills, in Staffordshire, has patented improvements for bleaching esparto. The grass after being boiled is well washed to remove the soda and other lye used in boiling. When washed the esparto is brought to a dry, or semi-dry state, this being done in any suitable form of hydro-extractor, or by heat, or natural drying. To shorten the period of drying the bulk of the moisture may be removed by passing the esparto between squeezing rollers or under a press. In this connection the material may be formed into blocks, or sheets, suitable for handling. When washed or brought to a dry or semi-dry condition the esparto is ready for bleaching. The bleaching operator is carried out in a closed rotary drum, and with the aid of a concentrated bleaching liquor in the manner set forth in a former patent (No. 3181, 1911). With the esparto introduced into the drum in a semi-dry or dry state, it more readily absorbs the bleaching liquor, while owing to the rotation of the drum the operation of bleaching is affected more quickly and economically than heretofore. In regard to the strength of the bleaching solution and the quantity used, the same strength and the proportions as those named in the prior specification may be adopted. The drum may also be plain on its interior, or fitted with agitators to break up or turn over the esparto; or the drum may be lined or unlined.

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The British paper mills during 1913, have had on the whole a fairly successful year—it can not be called a good year, because there were various factors to tell against large profits being made. From time to time the reports of companies and mill owners sent from London to the PULP AND PAPER MAGAZINE, have given an idea how things were going, but from experience it will be gathered that the coal strike of 1912 and the serious strikes that occurred spasmodically during that year and in the first half of 1913, have somewhat seriously militated against big profits being turned-over. However, there is hope for 1914, if the labor element can only be kept quiet. The British paper manufacturers also find it impossible to get any increased prices on their paper to meet the increased cost of production, which though not at times, has at other certain periods been more expensive. However, there is strong study on the part of paper mill engineers and mill owners to get as much as possible in the way of labor saving devices and machinery that will reduce the cost to a nicety. That is a point that is engaging great attention and during 1913, a large number of new machines have been installed and old and obsolete material brought up-to-date, or discarded as the case may be. Generally speaking the year was a good one for suppliers of paper-making machinery.

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Messrs. Charles Morsden & Sons, Ltd., announce a gross profit for their year of £25,661 and a net profit of £11,406. With the balance brought forward there is £12,492. They propose to unite off for depreciation £3,417, and as extra depreciation £3,000. A dividend of 2½% for the year is recommended on the ordinary shares, which has as subsidiaries the Anglo-Newfoundland Development, and the Imperial Paper Mills at Gravesend, have paid a dividend of 40% and bonus last year. The profits amounted to £372,329. A. Armstrong & Co., Ltd., paper merchants, have made a net profit (including interest on investments) of £5,031, which, with the balance from last account, £2,594 makes £7,625. The directors propose to put £500 to reserve, pay a dividend of 2½%, making 5% for the year, on the ordinary shares, and carry forward £2,596. The accounts of Albert E. Reed & Co. (Newfoundland),Ltd., for their year show that after charging debenture and other interest, and deducting the credit balance of £910 brought forward, a debit balance remains at profit and loss account, amounting to £13,3337. Another interesting financial item to pulp men in Canada is the amount of money Mr. Harry Wood, who died sometime ago, has left. It amounts to £25,225 gross and £20,986 net. Of course, Mr. Wood was in the pulp trade and often visited Canada.

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The project to inaugurate a British Dominion's Exhibition in 1915, has been fully endorsed in London. It will be held in the ground and buildings of the Crystal Palace. Canadian paper and pulp men should be interested to hear of the promotion of such an important exposition.

Two New Bills for Quebec Legislature

The Bill introduced by John Hall Kelly, M.P.P., from Bonaventure, provides that if a party owning a pulp and paper mill wishes to lay pipes over or under private property in order to bring water from some other point to be used in the mill, he will have the right to do so. After the pipes are laid, the owner of the soil will have the right to use the land, provided it does not injure or interfere with the pipes. If the parties can not come to an agreement, then expropriation proceedings will be taken under the Quebec Railway Act. Pulp mills are often obliged to go several miles from the mill to find the source of water supply. One private owner could tie up the whole business unless the charter of the company gave special powers to expropriate. In the future, the general law will give this right.

The second amendment relates to water powers. Under the Act before this amendment was passed, any one wishing to expropriate in connection with a water power, could not take possession of the land until a decision of the arbitrators was rendered. This was the cause of considerable delay and costs. With the amendment, the party expropriating will be able to obtain immediate possession, by giving security tp pay the amount of the award when it will be rendered and costs if any.

Union Bag Company

(Special to Pulp and Paper Magazine.)

New York, N.Y., Jan. 12th, 1914.

Certain factors in the local trade state that the new tariff bill has had little adverse effect upon the business of paper companies and that it has actually proved beneficial to earnings in some cases.

One concern which has benefitted from the lower duties on paper and pulp is the Union Bag & Paper Company, which is now not only able to bring in free the pulp from its Canadian pulp mills but saves some expenses on importations of certain grades of paper which it does not manufacture and which is used for making special types of bag.

Earnings of the Union Bag for the current fiscal year, which ends January 31st, promise to be somewhat in excess of those of last year. This is due to the improved demand for the bags this fall and to the better prices which have obtained for some time past. In the fall and winter of 1912 paper bags prices declined to an unprofitable level, and although advances were announced in the spring and early summer, there did not begin to show their effect upon earnings until about July as most of the company's turnout is contracted for some months in advance.

Since the middle of the year, however, prices have held steady and are now about 15% higher than at the same time last year. A revival of buying activity was witnessed in the fall, with some slackening in November. Present indications however, are that the spring business will be satisfactory.

Several important economies have been effected during the past year, among which was the removal of part of the office force to Hudson Falls, N.Y. Some of the company's departments have also amalgamated thus effecting a further saving.

In the fiscal year, 1912-13, Union Bag & Paper showed profits of $554,251 compared with $1,017,835 the year before. Dividends amounting to 3% on the $11,000,000 preferred stock were paid and after all charges a deficit of $287,000 was reported. The company's surplus on January 31st last was $1,563,827. As no dividends have been paid this year a small addition to suplus for the period is likely.

Forest Fires Minimized

The forest fire loss on Dominion Forest Reserves in Western Canada was smaller during the last season than ever before. On several of the reserves in Manitoba and Saskatchewan, fire occasioned no damage whatever, and on the Dominion reserves in the Railway Belt, B.C., the only green timber injured by fire was four acres of young lodgepole pine. Even on the Rocky Mountains reserve in Alberta, with the immense area of 13,373,856 acres, most of which is remote from settlement, fire destroyed only 1,150 acres of young timber, whose present value was small, and mature timber to the value of $150. The total area burnt on this reserve was but two one-hundredths of one per cent. of the above acreage, and it is likely, when the reports are complete from other reserves, which are smaller and usually better protected, that the aggregate area burnt over by fire will be no greater than one one-hundredth of one per cent. of the total reserved area. The significance of this figure is apparent by comparison with the corresponding figure for the National Forests in the United States, where the area burnt over by fire in 1913, although admittedly the smallest in recent years, was about 0.03% of the total area.

That the fire loss on Dominion reserves in the West has been so remarkably small is due in large measure to the fact that the Government rangers unceasingly sought, and obtained, the co-operation of all with whom they came in contact, whether settler, Indian, hunter, tourist or packer. The new fire-posters ask for this co-operation instead of demanding it as previously; a plea for it is printed on railway time-tables and on licenses; it is secured from homesteaders by provinding them with fire-fighting tools and by connecting rural telephone lines with ranger stations on forest reserves, and even the Indian, many of whom were careless with fire, are now induced to assist in its prevention by being presented honorary metal badges by the Dominion Government. Carelessness is the chief cause of forest fire and by its elimination the greatest difficulty in forest fire protection is overcome.

Mr. Jules Wood has been appointed superintendent of the Toronto Paper Company, at Cornwall. The company has made some changes in their organization.

PULP AND PAPER NEWS

The new plant of Gummed Papers, Limited, at Brampton, Ont., will shortly be in operation. The new building is 75x60 feet, two storys high, and erected of brick. It is located beside the C.P.R. tracks and the motive power will be steam and electricity. The equipment is right up-to-date and consists of two Keller gumming machines, each 60 feet long, a Langston ribbon slitter and rewinder and two Wetmore glue heaters. The capacity of the plant will be three tons per day of gummed paper tape for wrapping parcels, staying the corners of paper boxes, etc., and also gummed cloth for the same purpose. This is the first industry of its kind in the Dominion although the raw stock is made by several different mills. The President of the Company is Captain R. R. Barber, son of John R. Barber, Georgetown, and the vice-president and manager is E. R. Colbert, late superintendent of the coating plant of the Provincial Paper Mills at Georgetown, who has been in the coating and gumming business for fifteen years. J. H. Hood, for several years representing the National Binding Board Company of New York City, is Secretary-Treasurer and will also look after the sales end. The company have adopted the trade mark of a seal and the output will be known as "Seal Brand Products."

The annual sales convention of the Beaver Board Companies, who have a plant at Ottawa and are erecting another at Thorold, Ont., costing half a million dollars, in which the machinery is now being installed and will be in opeartion in April next, held their annual convention in Buffalo from January 5 to 10, which was attended by fully seventy salesmen, several being present from Canada. The remarkable growth of the Beaver Board companies during the past seven years was commented upon with much satisfaction, and the convention closed with a large All-Beaver banquet at the Satler hotel. The President of the Company is W. F. MacLashan, of Buffalo, and the vice-president is H. S. Lewis, Beaver Falls, N.Y. The engineer in charge of the new plant at Thorold, is E. E. Whitney.

On his return from England, Hon. Adam Beck, box manufacturer, who is Chairman of the Ontario Hydro-Electric Commission will be tendered a demonstration in Toronto which will be followed by a banquet. Representatives of the power union and all the municipalities using Hydro power will be present. A meeting was held in Toronto this week to make preliminary arrangements and it is expected that the event will come off some time next month.

As forecasted in the last issue, W. P. Gundy, Managing Director of W. G. Gage Company, Toronto, and the Kinleith Paper Mills, St. Catherines, Ontario, who has been vice-president of the Board of Trade in Toronto, has been unanimously elected to the Presidency of that influential body. Mr. Gundy, who is also vice-president of the Canadian Pulp and Paper Association, is receiving the congratulations of his many friends in the trade on his appointment.

The head offices of the Spanish River Pulp and Paper Mills, have been removed from the Royal Bank Building, 12 King Street, east, to the fourth floor of the Tyrell Building, 95 to 97 King Street, east, Toronto, where very convenient and nicely arranged quarters are now occupied.

G. A. Howell of the Howell Company, pulp and paper stock dealers, Toronto, appeared recently before the Railway Commission at its sitting in Toronto in reference to the difference in freight rates in imported sulphite pulp. to various points on the railways in Quebec Province. The company supplies pulp to Shawingan Falls and also to Windsor Mills. Although Windsor Mills is considerably nearer Montreal than Shawinigan Falls, the freight rate to the former place was higher than to the latter by one cent per hundred pounds. It was pointed out that this had militated against the possibility of doing business with Windsor Mills. Mr. Howell has just received word from the Commission which, after fully investigating the matter, has issued an order to the railway companies to reduce the freight rate from Montreal to Windsor Mills from nine to eight cents per hundred pounds which is the same as applies to Shawinigan Falls.

Toronto rag and paper stock dealers have received word that the import commodity rates on rags and waste paper stock to United States points via St. John, Halifax and Portland, have been discontinued by the C. P. R. and G. T. R. and that class rates will become effective in February 1st, which means an addition of three to four cents per hundred.

The publishers of Toronto have organized a publishers' Hockey League in which the Toronto World, the Southam Press, the Methodist Book and Publishing House, the Toronto Star, the MacLean Publishing Company and W. J. Gage Company have entered teams.

F. Sidney Ewens, for several years manager of the publication department of the Methodist Book and Publishing House in Toronto, died very suddenly a few days ago as a result of a paralytic stroke. He had been employed in this firm twenty-six years and was forty-one years old.

The Lakes Timber Company, Limited, with a share capital of $50,000 and head office in Fort Frances, have been granted a charter to cut timber and manufacture and deal in all kinds of timber, wood and timber products and to carry on the business of lumbermen. The company will operate in the Rainy River district. The incorporators of the company are William J. Law, A. D. Rahn, of Minneapolis, Minn., Otto H. Diercks of Rainy River, A. B. Colburn of International Falls, Minn. and William F. Zauke of Spooner, Minn.

Hydro bylaws were voted upon in the recent Ontario municipal elections in several towns. Hanover, Strathroy, Wallaceburg, Elora and Kemptville carried the bylaw by large majorities while the measure was defeated in Sandwich. The adverse majority in Sandwich is only the third of its kind in the history of the Ontario Hydro-Electric Commission, and, when the municipalities in which the people have voted the authority, have been linked up, the Commission will represent more than one hundred places in Ontario.

The Canada Paper Company, whose mills are located at Windsor Mills, Quebec, some time ago adopted the course recommended by several authorities in the Pulp and Paper Magazine of closing down the plant at noon on Saturdays. This avoided all Sunday work in the shape of overhauling, repairs, cleaning etc., which is done in the majority of paper mills on Sunday. All the employees of the company were given longer rest including those who had to labor on the latter day. The plan of shutting down the machines at noon on Saturday, worked first rate and every one was pleased, with the new system. The company have got so busy, however, that it has been found necessary to run all day Saturday until the present rush is over.

Following the usual custom, inaugurated by them several years ago, the W. J. Gage Company, Toronto, have given all their employes a bonus on the business of the past year, based on their length of service, individual earnings, etc. Speaking of profit sharing, Mr. Gage, in a recent interview, said that the company did not do it for effect, but because they believed that it was the right thing to do and the plan had proved mutually beneficial.

A charter has been granted to the French River Lumber Company with head office in Toronto and a share capital of $40,000 to conduct a lumbering and timber business in all its branches. The incorporators are Henry E. Hurlburt of VanDorf, Ont., and others.

Brown Bros., the oldest stsationery firm in Canada, in the manufacturing line, having been in business for sixty seven years, have just removed from 51-53 Wellington Street West, into their larger and more commodious quarters, in the building formerly occupied by Rolph and Clark, Limited, at the corner of Pearl and Simcoe Streets, Toronto, which they bought some months ago. Brown Bros. in their new home will add considerably to their facilities.

The Grolier Society of London, a corporation created under the laws of New York State, have obtained a supplementary license to do business in Ontario and have just opened up offices at 307 Manning Chambers, Toronto. The company are empowered to carry on the business of booksellers, publishers, lithographers, engraving, bookbinders, advertising agents, etc., and also to carry on the business of manufacturing, producing, purchasing, selling and dealing in all kinds of paper and all materials that may be used in such manufacture. Eric Fepler, of Toronto, has been appointed Canadian representative of the Grolier Society.

In the list of New Year honors bestowed by King George, among those decorated were Sir Douglas Colin Cameron, Lieutenant Govenor of Manitoba, and Sir Henry Kelly Egan, of Ottawa, both of whom are leading and wealthy lumbermen, Aubrey White of Toronto, Deputy-Minister of Lands and Forests, was made a C. M. G. (Commander of St. Michael and St. George). Mr. White has been in the service of the Ontario Government for thirty-eight years. He was chief clerk of the Forestry branch for seven years, and has held his present office since 1887. In his official capacity he has in connection with Crown lands concessions and timber licenses, has much to do with pulp and paper companies and is deservedly popular for his honorable business relations and excellent administrative ability in these matters

The premises of E. Pullan, rag and paper stock dealer, 490 Adelaide Street West, Toronto, was visited by fire last week, but the blaze was extinguished after damage to the extent of a few hundred dollars had been done.

William A. Anderson, the new superintendent of the Kinleith Paper Mills, at St. Catharines, who succeeds A. A. Briggs, who resigned owing to ill health and will reside at St. Catherines, has entered upon his new duties. Mr. Anderson, who was in charge of the Milham Division of the Bryant Paper Co., Kalamazoo, Mich., was, previous to his departure for St. Catherines, presented with a gold watch and chain and a beautiful Masonic charm by the four hundred employes of the mill, among whom he was deservedly esteemed. He has had wide experience as a papermaker and brings to bear on his new duties a thorough insight and practical acquaintance with every branch of the business.

Forbes Wood, late superintendent of the James Ramage Paper Co., of Monroe Bridge, Mass., has been appointed superintendent of the plant of the Toronto Paper Manufacturing Co., at Cornwall, and has entered upon his new duties, succeeding M. Carroll, who has resigned. Some years ago Mr. Wood was superintendent of the Cornwall mill and now returns to his former position after holding several important positions across the border.

The capital stock of Barber-Ellis, Limited, who have works in Brantford, Ontario, and warehouses in Toronto, Winnipeg and Vancouver and are the largest envelope manufacturers in the Dominion, has recently been increased from $125,000 to $500,000.

The six storey brick addition to the premises of Warwick Bros. and Rutter, manufacturing stationers and printers, 401 King St., West, Toronto has been completed and will add considerably to the facilities of the firm.

The Montreal Trust Co., liquidators of the East Canada Power and Pulp Co., are calling for tenders for the pulp wood of the latter company in the yard at Murray Bay, in the Murray River and its tributaries. Bids will be received up to February 2nd, and the successful tenderer may have the use of the mill and mill property of the company for the purpose of manufacturing the pulp wood into pulp until Spetember 1st, if desired.

It is announced that the Grand Falls Company, Limited, will begin work very soon and erect large pulp and paper mills at Grand Falls on the St.John River, where immense power can be developed, and where it is proposed by this company to build up a very extensive industry. It will be possible to develop electric power at Grand Falls and transmit it long distances to towns and villages along the river. Sir William Van Horne is associated with this enterprize. Various companies have secured rights and powers at different times with a view to development such as is now proposed, but for one reason or another nothing practical was accomplished. The present company has ample capital, and during the last year engineers have been at work upon its plans. Mr. Hardy S. Ferguson of New York, is the engineer. The International Paper Company is also interested.

Riordon Pulp and Paper Company renewed an option taken last summer on a large acreage at the southern limits of Haileybury, Ont. The option expired at the end of 1913. The company could not arrange for construction of the pulp mill proposed within the time of the option and a twelve months' renewal has been effected. Surveys will be started in the spring, with the possibilities of construction work starting in the summer.

An order in council has been passed amending the regulations governing the granting of licenses and permits to cut timber on Dominion lands in the prairie provinces, the northwest territories and certain parts of British Columbia. The amendment provides for the withdrawal from timber berths held under the license of land required for water power purposes. The condition for such withdrawal is that the lease of the water power will pay the license of the berth, the value of all timber of ten inches and over in diameter at the stump. The minister of the interior will fix the value of the timber in case of dispute. The new regulation is said to be in accordance with the government's new water power policy.

Plans are being arranged for the erection at Oakville, Ont., of Blotting Paper Mill. When this is completed, it will be the first in Canada.

Following the lead of the International Paper Company in the East, western manufacturers in the United States, of newsprint paper have decided to reduce materially their production in the mills of Wisconsin, Michigan, and Minnesota during 1914. Most of the manufacturers of newsprint paper, it is said will change to some other grades as far as business will permit. The International Company will curtail its production of newsprint by 100,000 tons next year. This reduction, in addition to that made in 1913 will decrease the output of that company about 25 per cent. Canadian competition is the chief reason stated by manufacturers in this country for restricting their newsprint production.

Because, as the bank claimed, he "interferred" with a quantity of logs and property of the defunct Imperial Pulp and Paper Mills, of Sturgeon Falls, the Quebec Bank, which was a leading creditor, sued E. R. C. Clarkson, official receiver of the mills, for damages. It seems that Mr. Clarkson, in the course of his winding-up proceedings, found part of the boom of logs, which the bank claimed to own, in imminent danger of going over the dam, and had them removed. For this service the bank thanked him with a damage suit. Judgment was given today at Toronto, the Master-In-Ordinary deciding that the bank, far from suffering from Mr. Clarkson's action, was in reality very much obliged to him for sparing them very considerable expense by his action in having the wood removed. The bank therefore loses its case.

Anchor ice has been seriously hampering some of the Canadian paper mills. One of the incidentals of such an unwelcome visitation has been to test a brand-new and very ingenious scheme put into effect by Mamager Millen, of the E. B. Eddy Company, at Hull, Quebec. When the company decided to more than double their old water powers by putting in new wheels and new systems and converting the whole into a hydro-electric plant, Mr. Millen planned a way out of the annual ice troubles He had the entire forebay covered with a concrete platform, and put two fans under this platform, and one fan inside, near the clear-story roof. These fans exhaust all the steam and hot air of the mill and inject into the vacant space over the water and under the flooring of the forebay. This keeps the temperature of the racks just sufficiently warm to prevent the ice from forming on them.

The Montreal Trust Company, of Montreal, the liquidator for the East Canada Pulp and Paper Company, Ltd., whose mill is at Murray Bay, Que., is calling for tenders for the purchase of the company's pulp wood in the yard at Murray Bay and in the Murray River and its tributaries. The tenders have to be in by February 2nd next. The successful tenderer will be given the use of the mill and mill property of the company at Murray Bay for the purpose of manufacturing the pulp wood into pulp until September 1st of this year.

The Canadian Northern Railway, which calls itself the paper mill road of Canada, inaugurated today a fast freight service between Montreal and Toronto on the new main line just completed. This will mean that many points—including such places as Strathcona, on the Bay of Quinte Railway—which formerly took branch line rates, are now given main line rates and freight service. The Canadian Northern Railway is now connected up with all the paper mill towns in Southern Ontario, as well as in the Province of Quebec. A day or two ago Sir William Mackenzie, the president of the company, drove the last spike connecting the eastern and western lines of the company. The ceremony took place north of Lake Superior, midway between Sudbury and Port Arthur. The company now has only to finish its line through the Rocky Mountains in order to have a continuous main line from the Atlantic to the Pacific. This will be done about midsummer.

The Canada Securities Corporation are offering $200,000 six per cent. first mortgage bonds of the Sheldons Limited of Galt, Ontario. The bonds are in denominations of $100, $500 and $1,000. The company's capitalization is $200,000 bonds issued; $600,000 ordinary stock authorized and $300,000 issued. The board of directors is comprized as follows: W. D. Sheldon, president; S. R. Sheldon, vice-president; Jas. M. Smith, John A. Stephenson, A. K. Spotton, all of Galt, Ont.; F. H. Manley, of Montreal, and J. H. Paine, Toronto.

ACCIDENT AT DONNACONA.

A disastrous accident which will have serious results occurred at the Donnacona Paper Company works situated at the mouth of the Jacques Catier River ~~in the parish of Les Ecureuils~~, when 200 feet of a steel pipe 12 feet in diameter ~~feel in~~. The accident is thus explained:

A vacuum was made in the pipe, but it is supposed that some air remained and when the water entered the pipe an explosion took place, bursting the pipe under the high pressure. This pipe was to carry the water to the workshops. Work was to be commenced for the manufacture of paper in these workshops, but this accident will delay the works for a month or six weeks, which will be a great loss for the company and for the workingmen.

It is stated that the damage by this accident will amount to about $10,000.

The Markets

Canadian Markets

Now that the holiday period is over and most of the paper houses and mills have completed inventories, the trade is looking forward to a good business year during 1914. New mills continue busy and prices remain firm. Those concerns looking for renewal contracts have held out for the same figure as last year and the majority of the larger operators have their output pretty well contracted for during the coming twelve months. In the book and writing paper line as well as in bonds, ledgers, etc., business is only fair and has not picked up as yet. However, the outlook is hopeful. The printing trade has not been as active as it was some months ago which caused a falling off in small quantity orders. Makers of wrappings of all kinds are keen for business and prices to jobbers are easier than they were several months ago. Ground wood pulp demand has fallen off and, while there are a number of inquiries, prices are not as firm as formerly, either at the mill or delivered. The sulphite situation is somewhat firmer owing to the close of navigation and the winter freight rates, particularly on foreign importations. In the rag and paper stock market there is not much doing and prices have taken a tumble in mixed papers and other lines such as mixed shavings, white blanks, roofing stock, etc. In fact, there has been a slight drop all around and mills are not disposed to buy freely at present. Mixed papers shipped from Toronto have been delivered in considerable quantity in New York and the western states and have brought less than ten dollars per ton. The paper houses which will soon hold their annual meetings will show, in some instances, as good a business as last year and in other cases a falling off. Some mills will show an advance but it is hardly expected that many will make the showing either in net profits or volume of 1912, which was a record year with most of them. That the future is looked forward to confidently, is attested by the fact that during the past week, new companies in various lines were organized in Ontario with an aggregate authorized capital of six million dollars. This is the best record made in many months.

Quotations f.o.b., Toronto, are as follows:

Paper

News (rolls) $42 to $45, delivered.
News (sheet) $45 to $50, delivered.
Book papers (carload) No. 3, 3.75c. to 4.50c.
Book paper (ton lots) No. 3, 4c. to 4.50c.
Book paper (carload) No. 2, 4.25c.
Book paper (tons lot) No. 2, 4.50c. to 5c.
Book papers (carload) No. 1, 4.75c. to 5.25c.
Book papers (ton lots) No. 1, 5.25c. to 7.75c.
Writings, 5c. to 7½c.
Sulphite Bond, 6½c. to 8½c.
Fibre, $3.00 to $3.75.
Manila B., $2.50 to $3.25.
Manila No. 2, $2.75 to $3.50.
Manila No. 1, $3.00 to $3.75.
Unglazed Kraft, $3.90 to $4.50.
Glazed Kraft, $4.50 to $5.00.

Pulp

Ground wood (at mill), $15 to $16.
Ground wood, $22 to $24, delivered in United States.
Sulphite (unbleached), $43 to $45, delivered in Canada.
Sulphite (unbleached), $43 to $46, delivered in United States.
Sulphite (bleached, $58 to $60, delivered in Canada.
Sulphite (bleached), $58 to $62, delivered in United States.

Paper Stock

No. 1 hard shavings, $1.87½ to $1.90.
No. 1 soft white shavings, $1.70 to $1.75.
No. 1 mixed shavings, 50c.
White blanks, 82½c. to 85c.
Ordinary ledger stock, $1.20.
Heavy ledger stock, $1.40 to $1.50.
No. 1 book stock, 70c.
No. 2 book stock, 45c. to 50c.
No. 1 manila envelope cuttings, $1.10 to $1.15.
No. 1 print manilas, 65.
Folded news, 50c.
Over issues, 52½c.
No. 1 clean mixed paper, 30c. to 32½c.
Old white cotton, $2.50 to $2.75.
Thirds and blues, $1.30 to $1.32½.
No. 1 white shirt cuttings, $5.00 to $5.25.
Blue overall cuttings, $3.50 to $3.62½.
Black overall cuttings, $1.75.
Black linings, $1.75.
New light flannelettes, $4.50.
Ordinary satinets, 75c.
Flock, 90c.
Tailor rags, 65.c

Quotations f.o.b. Montreal are:

Book and News Paper.

Roll News, $41 to $43 per ton for large orders; $45 to $50 per ton for small orders.
Ream News, $45 to $47 per ton for large orders; $50 to $75 per ton for small orders.
No. 1 Book, 5¼c. to 6c. per lb.
No. 2 Book, S.C., $4.60 to $4.75 in large quantities $4.75 to $5.50 in small quantities.
No. 3 Book M.F., $4.10 to $4.25 in large quantities $4.40 to $4.50 in small quantities.

Mostly all paper houses allow a discount of 2% to 3% for payment in 30 days.

Wrappings.

Grey Brown, per 100 lbs., car lots, $2.35; 5 tons, $2.45; 2 tons, $2.55; 1 ton, $2.56; less, $2.75.
Red Brown, car lots, $2.85; 5 tons, $2.95; 2 tons, $3.05; 1 ton, $3.15; less, $3.25.
B. Manilla, car lots, $2.85; 5 tons, $2.95; 2 tons, $3.05, 1 ton, $3.15; less, $3.25.
No. 2 Manilla, car lots, $3.10; 5 tons, $3.20; 2 tons, $3.30; 1 ton, $3.40; less, $3.50.
No. 1 Manilla, car lots, $3.35; 5 tons, $3.45; 2 tons,

$3.55; 1 ton, $3.65; less, $3.75.
Fibre, car lots, $3.35; 5 tons, $3.45; 2 tons, $3.55; 1 ton, $3.65; less, $3.75.
Kraft, 3¼c. to 4½c.

Most of the manufacturers are quoting 10% less than the above prices to the jobbing trade on the cheaper lines of wrapping.

Pulp.

Sulphite easy bleaching, $43 to $45 per ton.
News quality, $41 to $42 per ton.
Bleached sulphite, $54 to $59 per ton.
Kraft pulp, $3.60 to $4.00.
Ground woods, No. 1, $15 to $16.
Ground wood, No. 2, $22 to $24, delivered United States.

THE BRITISH MARKETS.

(Special to the Pulp and Paper Magazine.)

London, January 1st, 1914.

Owing to Xmas holidays and the dislocation of business generally the chemical and mechanical pulp markets are lifeless. There appears to be nothing doing at the moment of writing. A good deal of talk is current over the disappointment the Scandinavians have received through the American tariff. They were hoping that before the end of the year there would be a keen rush for pulps and consequently prices for British consumers were kept on a high level. It is suggested by pulp men that the Canadian mills will give the States in 1914 a larger supply than was the case in 1913 and this will prove another serious factor against the Scandinavians. In England, Canadian pulp is always appreciated, but there is the German and Scandinavian competition to be contended with. Scandinavian makers of pulps now maintain that though they have secured a fair amount of forward business in December, in the States, the fact must not be lost sight of that Canadian competition will in the near future have to be contended with. They admit that the tariff has caused disappointmant and concessions are now being made to British buyers who are in the market for pulps. But stocks are heavy and little is doing until the New Year is more advanced.

* * * *

The paper industry generally is quiet in England, at the moment owing to the holidays. Some of the mill men are on the Continent or in Switzerland having a short respite.

* * * *

Trade in fillings and loadings for paper manufacturers is quiet, but prices are firm. There is plenty of China Clay in stock, but Mineral White is very scarce just now.

* * * *

Esparto has reached a high level. Full prices are asked for and paid for prompt supplies, but forward shipments are checked owing to the high rates that prevail.

NEW YORK MARKETS.

(Special to the Pulp and Paper Magazine.)

New York, N.Y., Jan. 13th, 1914.

Makers of ground wood pulp during the past ten days have been forced to greatly reduce their operations. In consequence production at present is about 65% of capacity. This situation has naturally caused a slightly better feeling in the current inquiry, but producers who make pulp for sale only say they would rather hold their stocks and take a chance on the future than sell same at prices lower than those quoted at present. The general feeling prevails, that extreme cold weather will visit the manufacturing section soon, and if so, ground wood production would be greatly increased, and additional supplies eagerly sought after. Grinders are therefore accumulating stock. in anticipation of a stiff market before the early spring.

Movement in chemical pulps is inclined to be vary quiet at present. Consumers continue to hold off in their contract making and are only buying as actually needed. Importers, as well as domestic producers, however, are very optimistic as regards the future, and each and everyone express views that 1914 will witness a decided change for the better, both as regards prices and general demand. Many of the foreign mills say they have already contracted for their 1914 output, and if such is the case, they can afford to be very firm in their price views.

Waste papers and rags are still rather inactive. Mills either have a fair supply of stock on hand or are not running up to capacity. In most cases the former solution holds as local distributors say that answers to many of their offering, is to the effect that "we are well filled up." It is, however, the belief that mills are using this expression to force prices down. That they have succeeded in this to a certain extent is quite eivdent as prices are inclined to be very weak in all lines and distributors are only too anxious to dispose of supplies at very low figures.

Pulp.

Ground Wood, No. 1, $17 to $19 per ton,f.o.b.mill.
Ground Wood, No. 2, $15 to $16 per ton, f.o.b.mill.
Unlbeached sulphite, domestic, 20.05c. to 2.20c. per lb., delivered.
Unbleached sulphite, imported, 1¾c. to 2c. ex dock, New York.
Bleached sulphite, domestic, 2.90c. to 3c. per lb., delivered.
Bleached sulphite, imported, 2.70. to 2.95c. per lb., ex dock, New York.
Easy bleaching sulphite, imported, 2.10c. to 2.20c. per lb., ex dock, New York.
Unbleached sulphite, imported, 1.80c. to 2.10c. per lb., ex dock, New York.
Bleached sulphite, imported, 2.60c. to 2.80c. per lb., ex dock, New York.
Kraft pulp, imported, 1.85c. to 1.95c. per lb., ex dock, New York.
Soda pulp, domestic, 2.15c. to 2¼c. per lb., delivered
(All quotations of foreign products are made on a basis of ex duty.)

Paper.

A more cheerful aspect is to be found among the local paper trade, as regards the volume of business done since the opening of the new year—the larger consumers having shown a little more confidence in business conditions by placing many of their belated orders. The end of the year lagged a little slower than ordinarily, but the advent of 1914 seems to have witnessed a complete change. Now that the annual stock takings have been practically completed, and road salesmen have left head-quarters, there seems to be a much better undertone to the market. In fact not a few orders of good size have been placed during the past week, and nearly all lines are manifesting a much more steady undertone. It is too early yet, however, to make any predictions for this year, but it seems to be the consensus of opinion of all concerned that 1914 will witness a much more steady. One manufacturer today stated to your correspondent: "While the orders are still small, there is a marked improvement on the volume of my own business over that of a year ago as to make me forget the trials of the past, and as I find little complaint from other members of the trade, I assume that business must also be greatly improved in all other lines of paper. If it were not, you would find the anvil chorus swinging in full harmony. There is no doubt but that the new tariff is affecting nearly all lines, as the large buyers continue to hesitate in placing their orders very far ahead. A careful study of the industrial situation, shows that newsprint is much more steady in price, due to the fact that the disturbing factors have apparently filled their output for 1914 and withdrawn from the market. Manufacturers of book paper report a much more steady inquiry and though several orders have been placed at extremely low figures, the general situation is quite firm. Tissue papers are moving in a fair to active volume with prices ruling reasonably firm. Writings and other similar lines are still somewhat quiet, but the feeling is strong. Manilas are hard at current levels. Fibres are without change and reflect about the same situation. Makers of Bogus claim heavy orders in hand, and in consequence prices are being strictly adhered to. Krafts rule firm under a steady inquiry; boards are inclined upwards, most mills report plenty of orders on hand for sometime to come. Screenings continue to move in a good volume for this period. Quotations throughout the list have not changed since last reported, and are accordingly repeated as follows:

News, rolls, transient business $1.95 to $2.00 f.o.b. mill.
News, sheet, $2.10 to $2.15 f.o.b. mill.
Book papers, car lots, C. & S.S., $4 to $4.20 f.o.b. mill.
Book papers, car lots, M.F.S., $3.75 to $3.90 f.o.b. mill.
Writing paper, superfine, 11c. to 13c. del. east of Miss. River.
Writing paper, extra fine, 10½c., del. east of Miss. River.
Writing paper, No. 1, fine, 9c., del. east of Miss. River.
Writing paper, No. 2, fine, 8c. del. east of Miss. River.
Writing paper, engine sized, 4½c. to 8c. del. east of Miss. River.

UNITED STATES IMPORTS.

(Special to the Pulp and Paper Magazine.)

Washington, D.C., Jan. 13th, 1914.

Importations of Wood Pulp into the United States during the month of November, 1913, as reported by the Bureau of Foreign and Domestic Commerce, aggregated 31,324,656 lbs., mechanical, valued at $255,641; 48,606,108 lbs. chemical unbleached, valued at $809,817; and 5,709,671 lbs. chemical bleached, valued at $135,195.

Of this amount, Canada furnished 31,246,156 lbs. valued at $254,899 of mechanical pulp wood—there being but one other country (Norway, 78,500 lbs., valued at $742) shipping ground wood into this country.

Sweden was the heaviest exporter of unbleached pulp, having shipped into this country during November, 24,412,563 lbs., valued at $400,885, Canada, however, ranked second, with 11,129,120 lbs., valued at $196,810. The other countries shipping into the United States during this period were: Norway, 6,820,010 lbs.; Germany, 5,153,494 lbs.; Denmark 448,000 lbs.

Imports of chemical bleached pulp were heaviest during November from Norway—there being 2,016,000 lbs., valued at $46,652, brought into this country. Sweden exported 1,185,862 lbs., valued at $22,770, into this country. Germany was third with 990,228 lbs., valued at $23,903 and Canada fourth with 938,523 lbs., valued at $24,856. The remaining importation of this item came from Austria-Hungary, namely, 579,058 lbs., valued at $17,014.

Newsprint importations into this country during November, amounted to 48,286,712 lbs., valued at $949,982. Of this amount, Canada's share was 47,604,637 lbs., valued at $918,667. The balance follows:

	Lbs.	Value.
Austria Hungary	103,644	$ 347
Belgium	36,90	1,217
Germany	313,995	11,251
Italy	3,908	732
Netherlands	112,838	6,038
Norway	49,877	1,266
Sweden	42,660	1,443
England	90,107	7,888
Scotland	21,412	1,133
Canada	47,604,637	918,667
Total	48,286,712	$949,982

INTERNATIONAL REDUCES OUTPUT.

(Special to Pulp and Paper Magazine.)

New York, N.Y., Jan. 12th, 1914.

It is understood that the International Paper Company will make a considerable reduction in its newsprint production this year. While largely voluntary, this move is also dictated by overpropuction, Canadian competition and low prices. Though officials of the company refuse to confirm the report, it is stated by competent authorities that the curtailment in 1914 will amount to between 90,000 and 100,000 tons, or a cut-down of over 15%.

The prices of newsprint has weakened materially during the last three months and at one time was below two cents per pound. At present it is about two cents which is, however, $4 to $5 per ton less than the price contained in the expiring contracts which International and other producers hold for 1913 sales.

The broad point, is that Canadian competition is throwing into this market at the rate of 150,000 tons more of newsprint than a year ago. The outlook for 1914 among the newsprint producers is not an auspicious one. If International Paper manages to earn and pay its present 2% dividend on the $22,406,000 preferred, it will be doing all that can be expected.

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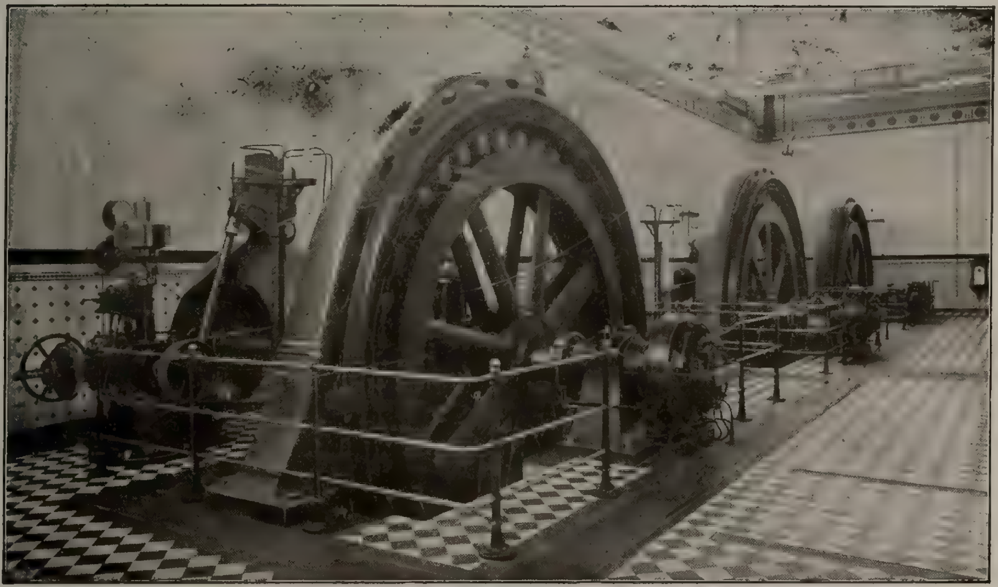

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1-800 K. W. Canadian Collieries
1-800 K. W. Dominion Coal Co.
2-675 K. W. Medicine Hat
1-750 K. W. Edmonton
1-750 K. W. N. S. Steel & Coal Co.
1-500 K. W. Wayagamack Pulp & Paper Co.
1-700 K. W. Canadian Collieries
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MANUFACTURE AND TREATMENT OF THE RUBBER COVERS ON THE ROLLERS OF PAPER MACHINES.

In order to liberate crude caoutchouc from albumens and from impurities such as sand and fragments of wood, the same is kneaded between ribbed water-cooled rollers and then dried. The sulphur requisite for vulcanizing anf the loading and hardening agents are mixed between steam-heated rollers of which the one rotates rather quicker than the other.

The room in which the rollers are covered with the layers of rubber must be absolutely free from dust and dry. The iron core of the roller is turned down only rough, because the rubber adheres better to a rough surface; blowholes must be filled up by caulking or hammering in rivets, because otherwise the rubber would be forced away from the iron owing to the expansion of the air when vulcanizing. Hollow rollers are connected with the steam pipe, and provision is made for leading off the water of condensation. In order to remove the rust, oil and dirt the hot roller should be washed with dilute sulphuric acid, then thoroughly rinsed with water in order to remove all the acid. After cooling, the roller is brushed with a hard steel wire-brush with methylated spirit, whereupon it is slightly heated until the spirit has volatilized.

The surface thus prepared has then applied to it a layer of ebonite whose sulphur (40%) intimately unites with the iron. Oxide of lead is frequently added to the ebonite. Other mills omit the oxide of lead and electrolytically coat the iron core with ferro-oxide, which likewise very much promotes the adherence of the ebonite.

In order to be quite certain that the surface of the roller contains no more air, it is gently heated and coated with a very thin solution of very good quality ebonite. After drying, a coat of a thicker solution follows and then the first thin layer of ebonite is placed on the entire breadth of the roller, firmly rolled and any bubbles of air which occur are removed by puncturing. Unevenesses are equalized by means of a wooden hammer and a knife. This bottom layer is cleaned with bezine and a second layer, which contains, instead of 40% sulphur, only 33%, is wound and firmly rolled. Wet strips of canvas corresponding to the breadth of the rollers are now wound round the two layers of ebonite thus applied, tied with string and the whole roller is treated in the vulcanising apparatus for an hour at first at about 100°C. The pressure is then increased to 3½ to 4 atmos. and maintained for 5 to 8 hours. After the roller has been removed and cooled the canvas is carefully removed the rubber is washed with benzine and then the application of the layers of soft rubber is begun. These consist of cheaper rubber which is placed round in the form of sheets about 0.5mm thick. The last layer may contain no substitutes, but specially good quality rubber must be employed. After the outer layer has been wound a wet canvas cloth is placed round it, firmly tied and the roller is vulcanized for 2½ hours more. After becoming quite cold, the canvas is removed and the roller turned down. Any cavities or hollows which appear are filled with rubber cement. The rubber coating is then ground with a rapidly rotating water-cooled disc of corundum of good quality.

Injuries to rubber rollers by sharp hard objects can be readily repaired if the lower layers of ebonite are uninjured. Detachment of the soft rubber from the ebonite is generally due to powder, such as dust, talc, etc., settling on the rubber sheets and not being removed when washing with benzine.

The cause of the surface becoming cracked and brittle is due to oxidation which is favored by moisture and light.

SALES OF STANDING TREES.

M. L. HAYWARD, B.C.L.

Probably the most important statute ever passed in any English speaking jurisdiction is the Statute of 29 Charles 2, Chapter 3, commonly called the "Statute of Frauds."

This Statute provides that all sales of "land or any interest therein," shall be in writing and signed by the party to be charged therewith, or by some person authorized by him.

Another provision is that no contract for the sale of "goods, wares and merchandise," for the price of £10 or upwards shall be good unless the buyers accept and receive part of the goods, or give something in earnest to bind the bargain, or in part payment, or, unless some note or memorandum in writing of the bargain be signed by the party to be charged thereby or by his agent.

These provisions with slight verbal changes have been re-enacted in practically every Province and State in Canada and the United States.

It will be noticed that on a sale of "land or any interest therein," there must be a writing signed by the party to be held; but in the case of "goods, wares and merchandise," a part payment or acceptance and receipt of part of the goods, is sufficient to bind the bargain.

Take then the ordinary case where A buys from B all logs and lumber standing and growing on a block of land owned by B and pays him $100 on account. The next day B gets a higher offer from somebody else and attempts to back out of his trade with A. A neat point then arises under the Statute, as it can be readily seen that if this is a "sale of land or any interest therein," it is not valid because it is not in writing; B can hand A back his money, and sell at the highest price. On the other hand, if it is merely a sale of "goods, wares and merchandise," the part payment binds the bargain, and A can hold B to the trade

There are two ways of looking at the question, first, that the growing trees are certainly part of the land at the time the contract is made, and it is, therefore, a sale of an interest in land; second, that it is merely a sale of the trees when cut down and converted into logs, and is therefore, a sale of goods, wares and merchandise.

The law is not at all settled on the point, and cases are to be found in England, Canada and the United States on both sides of the question. The great weight of authority, however, that when the trees are to be cut down and removed by the buyer, and the buyer stipulates for a certain period of time in which to do so, it is a sale of an "interest in land," and requires to be in writing.

Sales of standing trees and timber separate and apart from the land itself are of frequent occurence in the lumber trade, and the contract or deed of sale almost invariably specifies that the timber is to be cut and removed within a certain specified time. It is perfectly clear that any logs not cut within the allotted time remain part of the land, and the buyer has no right to them when the time limit expires. Suppose, however, that the buyer cuts the trees and piles them up on the land but does not remove them within the time limit. In such a case is his right gone or are the trees merely personal property which he has the right to remove at any time?

The Canadian law is well settled that in such a case the buyer has no right to enter the land after the expiration of the time limit, and the weight of authority in the United States is to the same effect, although there are a number of the States which hold otherwise.

The Quebec Government has sold its channel rights on the Jacques Cartier River to the Donnacona Paper Company for $1,000 on condition that the company spend $100,000 within four years for improving the hydaulic power. The mill will be in operation February 1st.

Mr. T. Linsey Cussley of Montreal, delivered a lecture on the "License of the Manufacture of Paper," before the American Club of Montreal, on January 10th. The lecture was fully illustrated with about fifty slides.

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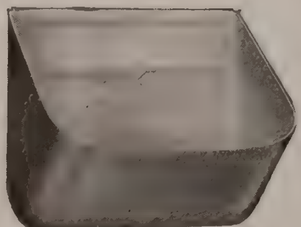

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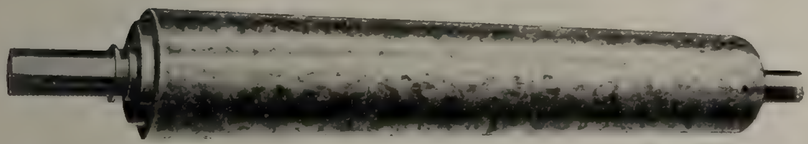

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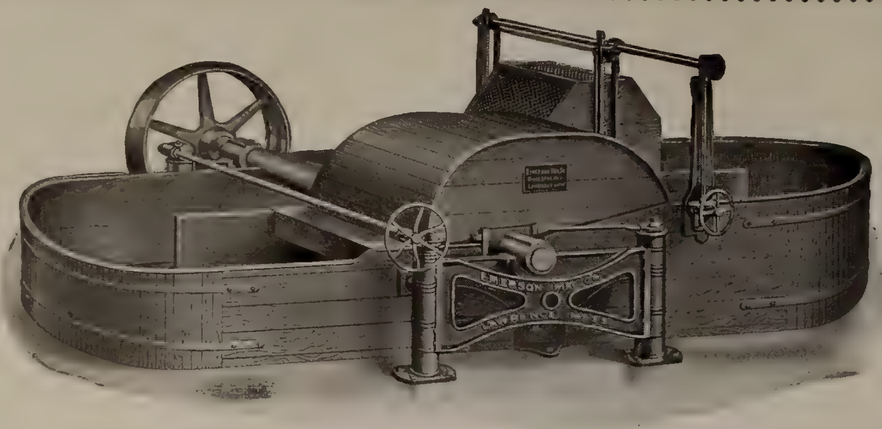

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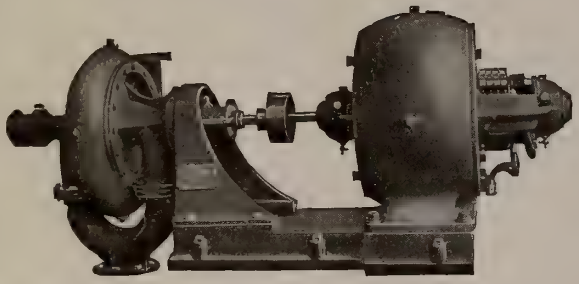

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Canadian Consolidated Rubber Co., Montreal, Can.
Presses
Boving & Co., of Canada, Limited, Toronto, Ont.
Can. Boomer & Boschert Press Co., Montreal, Can.
Chambers Ltd., 152 Bay Street, Toronto.
Jenckes Machine Co., Sherbrooke, Can.
Paper Stock, Etc.
Hough, R., London, England.
Pullan, E., 490 Adelaide Street, W., Toronto, Can.
Howell Co., Wellington Street, E., Toronto, Can.
Walker, J. R., & Co., 35 Common Street, Montreal, Can.
Paper and Pulp Machinery
Beloit Iron Works, Beloit, Wis.
Bentley & Jackson, Bury, England.
Bertram, James & Son, Ltd., Edinburgh, Scotland.
Bertram's, Ltd., Edinburgh, Scotland.
Black-Clawson Co., Hamilton, Ohio.
Canadian Boomer & Boschert Press Co., Ltd., Montreal.
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Chambers Ltd., 152 Bay Street, Toronto, Can.
Dillon Machine Co., Lawrence, Mass.
Emerson Mfg. Co., Lawrence, Mass.
Farrell Foundry & Mach. Co., Ansonia, Conn.
Fullner, H., Warmbrunn, Germany.
Glens Falls Machine Works, Glens Falls, N.Y.
Green Bay Barker Co., Green Bay, Wis.
Hamilton, Wm., Co., Peterboro, Can.
Harmon Machine Co., Watertown, N.Y.
Jenckes Machine Co., Sherbrooke, Can.
Jones, E. D. & Sons Co., Pittsfield, Mass.
Johnson, C. H. & Sons, Ltd., Montreal, Can.
Marx, J. & Co. London, E.C., England.
Moore & White Co., Philadelphia, Pa.
Process Engineers, Ltd., Montreal, Canada.
Rice, Barton & Fales .Worcester, Mass.
Sandy Hill Iron & Brass Works, Hudson Falls, N.Y.
Scott, Ernest & Co., Fall River, Mass.
Sheldons, Ltd., Galt, Can.
Sherbrooke Mach. Co., Ltd., Sherbrooke, Can.
Smith, S. Morgan, Co., York, Pa.
Stebbins Eng. & Mfg. Co., Watertown, N.Y.
Ticonderoga Machine Works, Ticonderoga, N.Y.
Voith, J. M., New York, N.Y.
Voith, J. M., Wurtemberg, Germany.
Walmsley, Chas. & Co., Bury, Eng.
Waterous Engine Works Co., Ltd., Brantford, Can.
Westbye, P. P., Peterboro, Can.
West End Engine Works Co., Edinburgh, Scotland.
Paper Machine Tachomoters
Boving & Co., of Canada, Limited, Toronto, Ont.
Schaeffer & Budenberg, Brooklyn, N.Y.
Paper Tester
Chambers Ltd., 152 Bay Street, Toronto.
Marshall, T. J. & Co., Stoke Newington, London, England.
Pipes (Wooden)
National Pipe & Foundry Co., Ltd., Montreal, Can.
Pneumatic Filters
Pneumatic Thickeners
Sherbrooke Mach. Co., Ltd , Sherbrooke, Que.
Pneumatic Chain Blocks
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Sherbrooke Mach. Co., Ltd., Sherbrooke.
Press Rolls
Bertrams Ltd., Edinburgh, Scotland.
Chambers Ltd., 152 Bay Street, Toronto.
Sherbroke Mach Co Ltd , Sherbroke, Que.
Press Wire Cloth.
Chambers Ltd., 152 Bay Street, Toronto.
Kufferath, Andreas, Mariaweiler, Germany.
Pulp Stones
Stancliffe Estates Co., Ltd., Darley Dale, England.
Pumps
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Machine Co., Lawrence, Mass.
Glen Falls Machine Works, Glens Falls, N.Y.
Hamilton, Wm., Co., Peterboro, Can.
Lawrence Machine Co., Lawrence, Mass.
Lawrence Pump & Engine Co., Lawrence, Mass.
Smart-Turner Machine Co., Hamilton, Can.
Sherbrooke Mach. Co., Ltd . Sherbrooke, Que.
Voith, J. M., New York, N.Y.
Rags
Walker, J. R. & Co., Montreal, Can.
Recording Gauges
Schaeffer & Budenberg, Brooklyn, N.Y.
Recording Thermometers
Schaeffer & Budenberg, Brooklyn, N.Y
Refiners
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Marx, J. & Co., London, E.C., England.
Process Engineers, Ltd., Montreal, Canada.
Rice, Barton & Falls Mach. & Iron Co., Worcester, Mass.
Voith, J. M., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford, Can.
Rope Blocks
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Rosin Size
Fox, Stockell & Co., London, Eng.
Paper Makers Chemical Co., Easton, Pa.
Process Engineers, Ltd., Montreal, Canada.
Vera Chemical Co., North Milwaukee, Wis.
Wilson-Paterson Co., Board of Trade Bldg., Montreal, Can.
Rosin Size Boilers and Dissolvers
Boving & Co., of Canada, Limited, Toronto, Ont.
Rotary Sulphur Furnaces
Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Pulp Mill Machinery Co., Montreal, Can.
Stebbins Engineering and Manufacturing Co., Watertown, N Y.
Runways—Hand operated
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Save-Alls
Boving & Co., of Canada, Limited, Toronto, Ont.
Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
Waterous Engine Works Co., Ltd., Brantford, Can.
Self Landing, Self Delivery Hoists
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Screen Plates
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Screens
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Glens Falls Mach. Wks., Glens Falls, N Y
Harmon Machine Co., Watertown, N.Y.
Jenckes Machine Co., Sherbrooke, Can.
Johnson, Chas., St. Henry, Que.
Marx & Co., J., London, England.
Process Engineers, Ltd., Montreal, Canada.
Sherbrooke Mach. Co. Ltd . Sherbrooke, Que
Tippet Arthur P. & Co., Montreal, Can.
Voith, J. M., New York, N.Y.
Voith, J. M., Wurtemberg, Germany.
Waterous Engine Works Co. Ltd., Brantford, Can.
Westbye, P. P., Peterboro, Can
Shear Legs
Morris, Herbert, Hoist & Crane Co., Toronto, Ont.
Slings
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Slitters and Re-Winders
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Moore & White Co., Philadelphia, Pa.
Ticonderoga Machine Works, Ticonderoga, N.Y.
Smelting Furnaces
Boving & Co., of Canada, Limited, Toronto, Ont.
Straw Cutters'
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Straw Dusters
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Straw Digesters
Boving & Co., of Canada, Limited, Toronto, Ont.
Strawboard Making Machines
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Steam Regulator
Pickles, W. F., Buckland, Conn.
Stuff Chests
Boving & Co., of Canada, Limited, Toronto, Ont.
Sulphite Mill Equipment
Boving & Co., of Canada, Limited, Toronto, Ont.
Stebbins Engineeringand Manufacturing Co., Watertown, N.Y
Sulphate Mill Equipment
Boving & Co., of Canada, Limited, Toronto, Ont.
Sulphur
Union Sulphur Co., 17 Battery Place, New York, N.Y.
Sulphur Burners
Boving & Co., of Canada, Limited, Toronto, Ont.
Glens Falls Machine Works, Glens Falls, N.Y.
Stebbins Engineering and Manufacturing Co. Watertown, N.Y.
Tachometers (Hand and Stationary)
Boving & Co., of Canada, Limited,Toronto, Ont.
Schaeffer & Budenberg, Brooklyn, N.Y.
Track Systems
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Tanks
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Boving & Co., of Canada, Limited, Toronto, Ont.
Hamilton, Wm., Co., Peterboro, Can.
Jenckes Machine Co., Sherbrooke, Can.
McDougall, John, Caledonian Iron Works, Montreal, Can.
Thermometers
Schaeffer & Budenberg, Brooklyn, N.Y.
Transmission Machinery
Caldwell, H. W. & Son Co., Chicago, Ill.
Canadian Allis-Chalmers, Limited Toronto.
Boving & Co., of Canada, Limited, Toronto
Jones & Glassco, Montreal, Can.
Dodge Manufacturing Co.. Montreal, C
Traveling Cranes
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Trolleys
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

MILL SUPPLIES---Continued

Turbines
Boving & Co., of Canada, Toronto, Ont.
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Jenckes Machine Co., Ltd., Sherbrooke, Can.
Smith, S. Morgan Co., York, Pa.
Voith, J. M. Co., Inc. New York, N.Y.
Voith, J. M., Wurtemberg, Germany.

Water Wheels
Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Hamilton, Wm. Co., Ltd., Peterboro, Can.
Jenckes Machine Co., Sherbrooke, Can.
Smith, S. Morgan Co., York, Pa.
Voith, J. M., New York, N.Y.

Wire Cloth for Paper Machines
Chambers, Ltd., Toronto.
Christie, Geo., Ltd., Glasgow, Scotland.
Johnson, C. H. & Sons, Ltd., St. Henry, Montreal, Que
Kufferath, Andreas, Mariaweiler, Germany.
Tippet, Arthur P. & Co., Montreal, Can.
Taylor, J. A., Montreal, Can.
United Wire Works, Ltd., Edinburgh, Scotland.
Westbye, P. P., Peterboro, Can.

Waste
Hough, R., London, England.

Wet Machines
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Glens Falls Machine Works, Glens Falls, N.Y.
Hamilton, Wm. Co., Peterboro, Can.
Jenckes Machine Co., Sherbrooke, Can.
Process Engineers, Ltd., Montreal, Canada.
Sherbrooke Machinery Co., Sherbrooke, Can.
Voith, J. M., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford Ont.

PULP AND PAPER MILL PRODUCTS

This aims to be a complete list of the products of Canadian Pulp and Paper Mills, who are urged to send us lists of brands and watermarks, as well as the headings under which they wish to be indexed. Buyers who cannot meet their requirements from this list, are invited to communicate with the editor, who is in close touch with the mills, and will gladly furnish full information.

PULP MILLS

Ground Wood Pulp
Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
Basin Electric Light & Power Co., Ltd., Montmagny, Que.
Beaver Co. Ltd., Thorold, Ont.
Belgo-Canadian Pulp & Paper Co., Shawinigan Falls, Que.
Brompton Pulp & Paper Co., Brompton and E. Angus, Que.
Booth, J. R. Ottawa, Ont.
Bronson Co., Ltd., Ottawa, Ont.
Clyde River Pulp & Paper Co., Ltd., Liverpool, N.S.
Colonial Wood Products Co., Ltd., Thorold, Ont.
Campbell Lumber Co., Weymouth, N.S.
Canada Paper Co., Ltd., Montreal, Que.
Chicoutimi Pulp Co., Chicoutimi, Que.
Compagnie de Pulpe de Dalmas, Dalmas, Que.
Davy, James, Thorold, Ont.
Eddy Co., The E. B., Ltd., Hull, Que.
East Canada Power & Pulp Co., Ltd., Nairn Falls, Que.
Foley-Rieger Pulp & Paper Co., Ltd., Thorold, Ont.
Ford, J. & Co., Port Neuf, Que.
Jacques-Cartier Pulp & Paper Co., Montreal.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
La Cie de Metabetchouan, St. Andre, Que.
La Havre Pulp Co., Ltd., Bridgewater, N.S.
Lake Megantic Pulp Co., Lake Megantic, Que.
Laurentide Co., Ltd., Grand Mere, Que.
MacLaren Co., Ltd., The James, Buckingham, Que.
McLeod Pulp Co., Ltd., Liverpool, N.S.
News Pulp & Paper Co., Ltd., St. Raymond, Que.
Nicolet Falls Pulp & Lumber Co., Nicolet Falls, Que.
North Shore Power, Railway & Navigation Co., Clarke City.
Northumberland Paper & Electric Co., Campbellford, Ont.
Nova Scotia Wood & Pulp Co., Ltd., Mill Village, N.S.
Ontario Paper Company, Thorold, Ont.
Ouiatchouan Falls Paper Co., Ouiatchouan Falls, Que.
Powell River Co., Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que.
Price-Porritt Pulp & Paper Co., Rimouski, Que.
Reed, A. E. & Co., (Nfld.), Ltd., Bishop's Falls, Nfld.
River-du-Loup Pulp Co., Ltd., Fraserville, Que.
Soucy, F. Florentine, Old Lake Road, Que.
Spanish River Pulp and Paper Mills, Ltd., Espanola, Ont., Sturgeon Falls, Ont., Toronto, Ont., and Sault Ste. Marie, Ont.
St. George Pulp and Paper Co., St. George, N.B.
Thorold Pulp Co., Ltd., Thorold, Ont.
Trent River Paper Co., Ltd., Frankford, Ont.
Union Bag & Paper Co., Cape Madeleine, Que.
Trent Valley Paper Mills, Glenmiller, Ont.
Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Q

Kraft
Brompton Pulp & Paper Co., East Angus, Que.
Dryden Timber and Power Co., Dryden, Ont.
New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
Quebec and St. Maurice Industrial Co., La Tuque, Que.
Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que

Soda Fibre
Canada Paper Co., Ltd., Montreal and Toronto.
Dominion Paper Co., Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.

Sulphite Fibre
Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
Booth, J. R., Ottawa, Ont.
Dominion Pulp Co., Ltd., Chatham, N.B.
Edward Partington Pulp & Paper Co., Ltd., St. John, N.B.
Eddy Co., The E. B., Ltd., Hull, Que.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Lake Superior Paper Co., Ltd., Sault Ste. Marie, Ont.
Powell River Co., Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que.
Riordan Pulp & Paper Co., Ltd., Montreal, Que.
Spanish River Pulp and Paper Mills Ltd., Sturgeon Falls, Ont., and Sault Ste. Marie, Ont.
Swanson Bay Forests, Wood, Pulp & Lumber Mills, Ltd., Swanson, Bay, B.C.
Toronto Paper Mfg. Co., Ltd., Cornwall, Ont.

PAPER MILLS

Bag
Eddy, The E. B. Co., Ltd., Hull, P. Q.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
Ford, J. & Co., Port Neuf.
Wilson, Ltd., J. C., 61 St. Alexander Street, Montreal, Que.
Jonquiere Pulp Co., Jonquiere, Que.

Binders' Board
McArthur, Alex. & Co., Montreal.
Northumberland Paper and Electric Co., Campbellford, Ont.

Blotting
Canada Paper Co., Montreal, Que., "Velvet Blotting."

Board
See Wood Board and Cardboard Specials.

Bond
Canada Paper Co., Ltd., Montreal, Que. "Burmese Bond," "St. Lawrence Bond," "Canada Bond," "Burmese Linen Ledger," "Windsor Mills Special," "Silverstream," "Springvale," "Super Writing," "White Railway," "Railway Manilla,"
Howard Smith Paper Mills, Ltd., Montreal & Beauharnois, Que.
Kinleith Paper Co., Ltd., St. Catharines, Ont.
Rolland Paper Co., St. Jerome, Que., Mount Rolland, Que. and Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Book and Litho
Canada Paper Co., Ltd., Montreal, Que. "Art Photo Book," "Tinted Art Book," "Art Chromo," "English Book," "Satin Book," "Satin Litho," "Litho Label," "Super S. C. Book," "Standard S. C. Book," "Windsor Book."
Eddy Co., The E. B. ,Ltd., Hull, Que.
Kinleith Paper Co., Ltd., St. Catharines, Ont.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Box Board
See Wood Board and Cardboard Specials.

Dominion Timber Regulations

Licenses to cut timber on Dominion Lands in the Provinces of Manitoba, Saskatchewan, and Alberta, the Northwest Territories, within twenty miles on either side of the main line of the Canadian Pacific Railway in the Province of British Columbia, and in the tract of three and one-half million acres to be located by the Government of the Dominion in the Peace River district in the Province of British Columbia, lying east of the Rocky Mountains and adjoining the Province of Alberta, shall be disposed of by public auction at the office of the Dominion Timber Agent for the district in which the berths are situated.

Before any parcel of timber is offered for sale it shall be surveyed by a duly qualified Dominion Land Surveyor into berths of an area not exceeding twenty-five square miles, and each of such berths shall then be thoroughly cruised by a duly qualified timber cruiser in the employ of the Dominion Government. The Minister shall then fix an upset price at which the berth shall be disposed of, and no berth shall be sold at less than the price so fixed.

Purchases to the amount of one thousand dollars or under shall be paid in cash at the time of sale. Purchases over one thousand dollars and not exceeding five thousand dollars shall be paid, one-half in cash at the time of sale, and a note or notes shall be given for the remaining half of the purchase price, payable in three months, with interest at the rate of five per cent. per annum. Purchases over five thousand dollars and not exceeding ten thousand dollars shall be paid one-third in cash at the time of sale, and notes shall be given for the remaining two-thirds of the purchase price, payable in three and six months, with interest at the rate of five per cent. per annum. Purchases exceeding ten thousand dollars shall be paid one-fourth in cash at the time of sale, and notes shall be given for the remaining three-fourths of the purchase price, payable in three, six and nine months, with interest at the rate of five per cent. per annum. Notes shall be made payable at a bank in the city or town in which the sale is held or at a bank in the city of Ottawa. Cash payments must be made at the time of sale in legal tender or by an accepted cheque on a chartered bank, or by a draft issued by a chartered bank, payable to the order of the Deputy Minister of the Interior. If default is made in any payment required by this section the sale shall be forfeited and void.

The purchaser must also pay the cost or the estimated cost of the survey of the berth before a license is issued.

The licensee shall pay an annual ground rent of five dollars per square mile except for lands situated to the west of Yale, in the Province of British Columbia, in which case the yearly ground rent shall be five cents per acre.

The licensee shall pay the following dues on timber cut on his berth:—

Sawn lumber, 50 cents per thousand feet, board measure.

Railway ties, eight feet long, 1½ cents each.

Railway ties, nine feet long, 1¾ cents each.

Shingle bolts, 25 cents per cord.

And 5 per cent. on the sale of all other products of the berth.

Timber Permits

Yearly permits are granted to settlers, mine operators and others on application to the Dominion Timber Agents, from whom further information can be obtained.

W. W. Cory
Deputy Minister.

Department of the Interior, Ottawa,
December 20th, 1912.

PAPER MILLS---Continued

Bristol

Don Valley Paper Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.
Canada Paper Co., Montreal & Toronto, "King Bristol," "Windsor Bristol," "C. P. S.Tinted Bristol," "Canada Bristol."

Building and Sheathing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que.
British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
Eastern Paper Co., Ltd., St. Basile, Que.
Montreal Paper Co., St. Basil, Que.
Northumberland Paper and Electric Co., Ltd., Montreal.
Riordon Pulp and Paper Co., Ltd., Montreal, Que.
Western Paper Mills, Ltd., Vancouver, B.C.
Jonquiere Pulp Co. Ltd., Jonquiere, Que.
Ford, R. & Son, Port Neuf, Que.
Laurentide Co., Ltd., Grand Mere, Que.
McArthur, Alex. & Co., Montreal, Que.
McLeod Pulp Co., Ltd., Liverpool, N.S.
Walker, J. R. & Co., Montreal, Que.

Cardboard Specials

Hinde & Dauche Paper Co., Ltd., Toronto, Ont.
Jonquiere Pulp Co., Jonquiere, Que.
Macleod Pulp Co., Ltd., Liverpool, N.S.
Canada Paper Co., Windsor Mills, Que. "Victor Printers' Blanks," "Superior Translucent Bristol," " C.P.C. Coated Litho," "Superfine Litho Blanks."
Booth, J. R., Ottawa, Ont.
Eddy, E. B. Co., Ltd., Hull, Que.
Laurentide Co. Ltd., Canada Life Building, Montreal, Que.

Carpet Lining

Ford, J. & Co., Port Neuf Station, Que.
Montreal Paper Co., St. Basile, Que.
Northumberland Paper & Electric Co., Ltd., Campbellford, Ont.
Wentworth Paper Mills, West Flamboro, Ont.
Western Paper Mills, Ltd., Vancouver, B.C.

Coated

Ritchie & Ramsay, Toronto, Ont.
Georgetown Coating Mills, Ltd., Georgetown, Ont.
National Paper Co., Valleyfield, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.

Corrugated Paper

Lazier Paper Mills, Ltd., Belleville,
Hinde & Dauche Paper Co., Ltd., Toronto, Ont.

Cover

Canada Paper Co., Ltd., Montreal and Toronto, "Tinted Art Cover," "Derby Cover," "Fibrestoc Cover," "Cashmere Cover," "X Cover," "XX Cover."
Eddy Co., The E. B. Ltd., Hull, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Ritchie & Ramsay, Toronto, Ont.

Envelope

Don Valley Paper Co., Ltd., Toronto.
Kinleith Paper Co., Ltd, St. Catherines, Ont.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Felts

Bird, F. W. & Sons, Hamilton, Ont., and Pont Rouge, Que.
Eastern Paper Co., Ltd., St. Basile, Que
McArthur, A. & Co., Montreal, Que.
Ford, J. & Co., Port Neuf, Que.
Ford, R. & Son, Port Neuf Station, Que.
Montreal Paper Co., St. Basile, Que.
Northumberland Paper & Electric Co., Ltd., Campbellford.
Western Paper Mills, Ltd., Vancouver, B.C.

Fibre

Canada Paper Co., Ltd., Montreal and Toronto.
Dominion Paper Co., Montreal, Que.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
McArthur, Alex. & Co., Montreal, Que.
Riordon Pulp and Paper Co., Merritton, Ont.
Strathcona Paper Co., Strathcona, Ont.
Wilson, Ltd., J. C., Montreal, Que.

Flour Sacks

Eddy Co., The E. B., Ltd., Hull, Que.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal.

Glazed

Provincial Paper Mills Co., Ltd., Toronto, Ont.

Hanging

Lincoln Paper Mills Co., Ltd., Merritton, Ont.
McArthur, Alex. & Co., Montreal, Que.
Moira Paper Mills, Belleville, Ont.
Riordon Pulp and Paper Co., Ltd., Montreal, Que.
Strathcona Paper Co., Strathcona, Ont.

Kraft

Brompton Pulp & Paper Co. Ltd., East Angus, Que.
Dominion Paper Co. Ltd., Montreal, Que.
Dryden Timber and Power Co. Ltd., Dryden, Ont.
New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que.

Leather Friction Board

Walker, J. R. & Co., Montreal, Que.

News

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
Belgo-Canadian Pulp and Paper Co., Shawinigan Falls, Que.
Booth, J. R., Ottawa, Ont.
Canada Paper Co., Ltd., Montreal and Toronto, "Canada Brand."
Eddy Co., The E. B., Ltd., Hull, Que.
Ford, Joseph & Co., Port Neuf, Que.
Fort Frances Pulp & Paper Co., Ltd., Fort Frances, Ont.
Jonquiere Pulp Co., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Lake Superior Paper Co., Sault Ste. Marie, Ont.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
McArthur, Alex. & Co., Montreal, Que.
Miller Bros. Co., Ltd., Glenmiller, Oht.
News Pulp & Paper Co., Ltd., St. Raymond, Que.
Powell River Co. Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que.
Riordon Pulp and Paper Co., Ltd., Montreal, Que
Spanish River Pulp & Paper Mills, Ltd., Toronto, Ont.
Ontario Paper Co., Thorold, Ont.

Roofing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que.
Ford, Joseph & Co., Port Neuf, Que.
Ford, Rowland and Son, Port Neuf, Que.
Montreal Paper Co., St. Bazile, Que.
Walker, J. R. & Co., 35 Common, Montreal, Que.
Western Paper Mills, Ltd., Vancouver, B.C.

Straw Board

Ford, J. & Co., Port Neuf, Que.
Lazier Paper Mills, Ltd., Belleville.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
McArthur, A. & Co., Montreal, Que.
Moira Paper Mills, Belleville, Ont.
Northumberland Paper & Electric Co., Campbellford, Ont.
Trent River Paper Co., Ltd., Frankford, Ont.
Trent Valley Paper Mills, Glenmiller, Ont.

Tag

Don Valley Paper Co., Ltd., Toronto, Ont.
Eddy, The E. B. Co., Ltd., Hull, Que.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
J. R. Booth, Ottawa, Ont.

Tissue and Toilet

Eddy Co., The E. B., Ltd., Hull, Que.
Garden City Paper Mills, Ltd., St. Catharines, Ont.
Interlake Tissue Mills, Ltd., Merritton, Ont.
Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Que

Wall Board

Beaver Co., Ltd., Beaverdale, Que.
Bishoprick Wallboard Co., Ottawa, Ont.

Wood Board

Beaver Co. Ltd., Thorold, Ont.
Booth, J. R. Ottawa.
Brompton Pulps Paper Co. Ltd., East Angus, Que.
Canada Paper Co., Montreal, Que.
Eddy Co., The E. B., Ltd., Hull, Que.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Northumberland Paper & Electric Co., Campbellford, Ont.
McLeod Pulp Co., Liverpool, N.S.
Western Paper Mills, Ltd., Vancouver, B.C.
Wilson, J. C., Ltd., 61 St. Alexander St., Montreal Que.

Wrapping

Booth, J. R., Ottawa, Ont.
Canada Paper Co., Ltd., Montreal and Toronto, "Scotch Fibre," "Invictus Fibre," Hercules Manilla," "St. Fancis Manilla," "Wave Crest Drug."
Dominion Paper Co., Montreal, Que.
Don Valley Paper Co., Ltd., Toronto, Ont.
Eddy Co., The E. B., Ltd., Hull, Que.
Ford, J. & Co., Port Neuf, Que.
Ford, Rowland, Port Neuf, Que.
Gore Valley Paper Mills, Dundas, Ont.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Canada Paper Co., Monreal and Toronto.
See also Kraft.

Writing

Howard Smith Paper Mills Ltd., Beauharnois, Que.
Kinleith Paper Co., St. Catherines, Ont.
Rolland Paper Co., Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Manufacturing Co., Cornwall, Ont.

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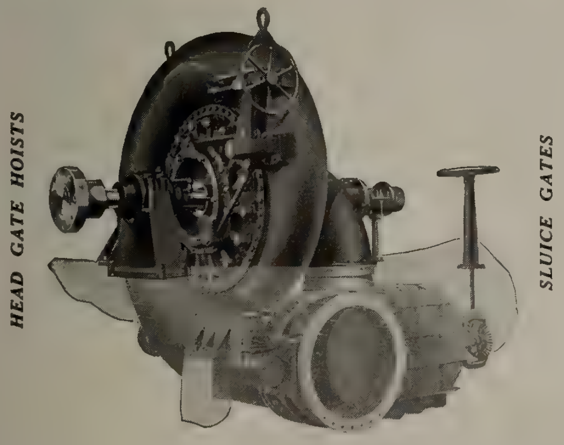

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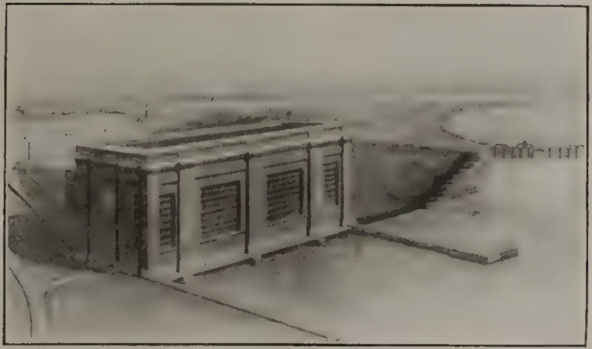

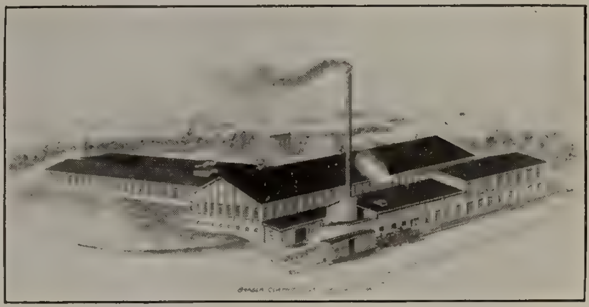

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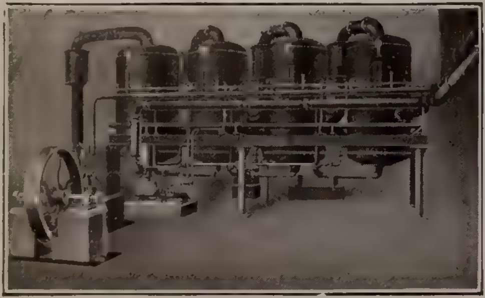

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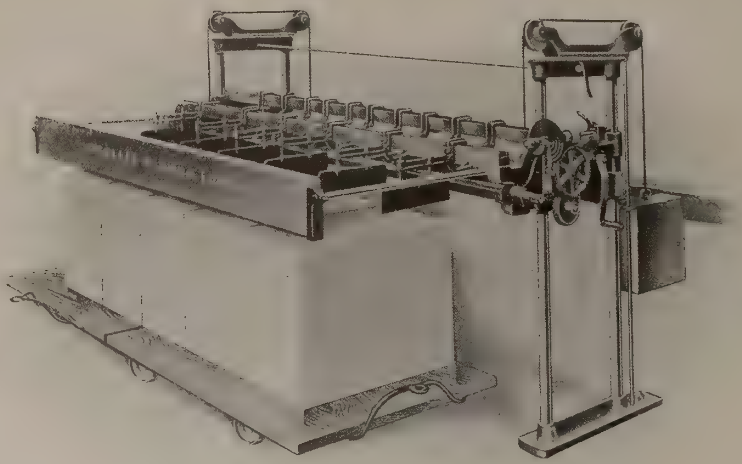

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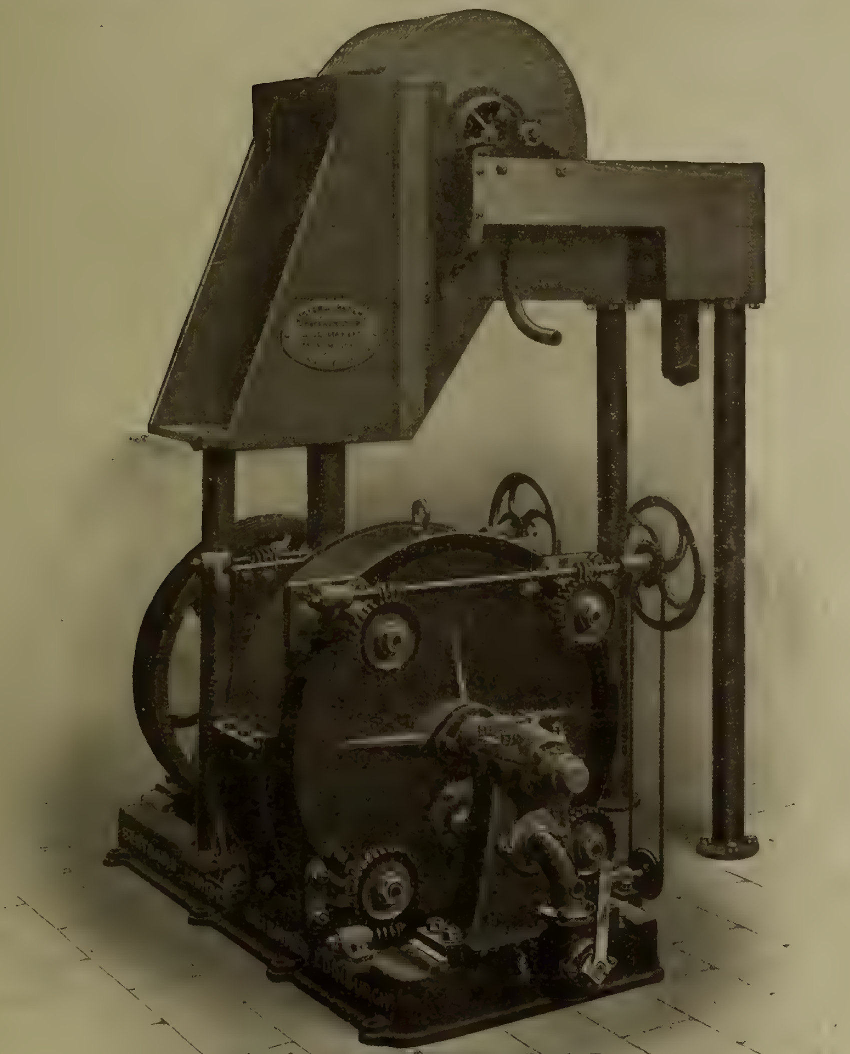

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The Pickle Automatic Steam Regulator

Saves steam

It also retains the proper amount of moisture in the paper thus eliminating the breaks at the calenders.

This regulator gives you a higher and more uniform finished paper with less calendering.

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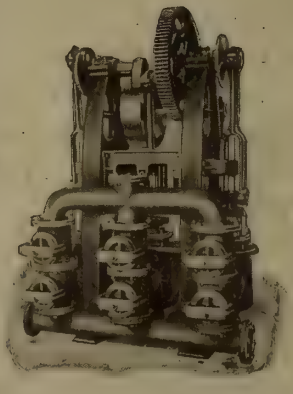

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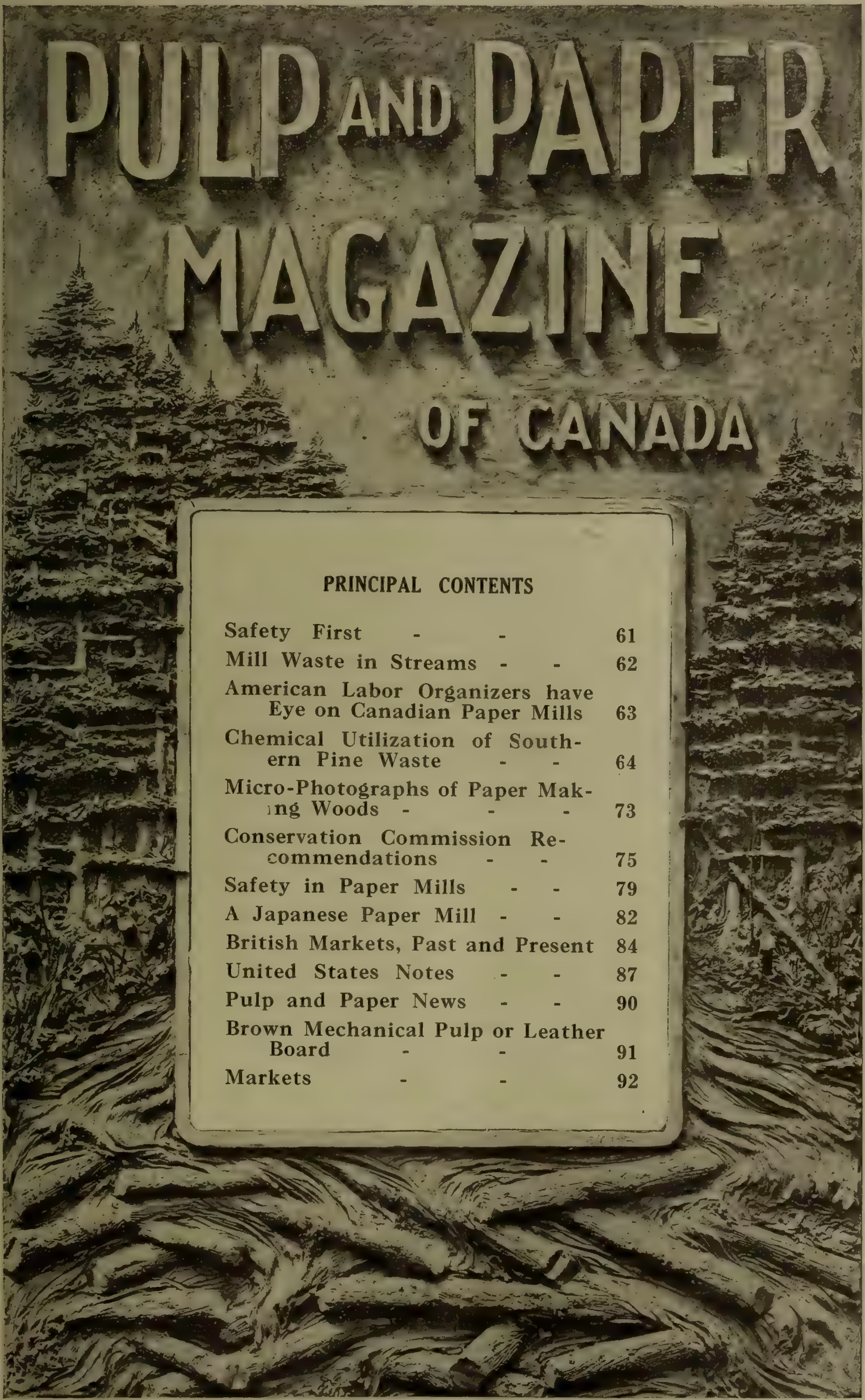
HAMILTON - CANADA

PENMAN'S, LIMITED, St. Hyacinthe, Que. Selling Agents, SAML. JARDINE, Toronto, Ont.

VOL. XII. MONTREAL, FEBRUARY 1, 1914 No. 3

PULP AND PAPER MAGAZINE OF CANADA



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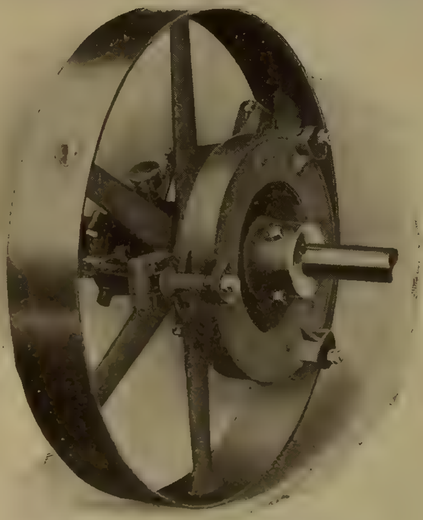

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Gears
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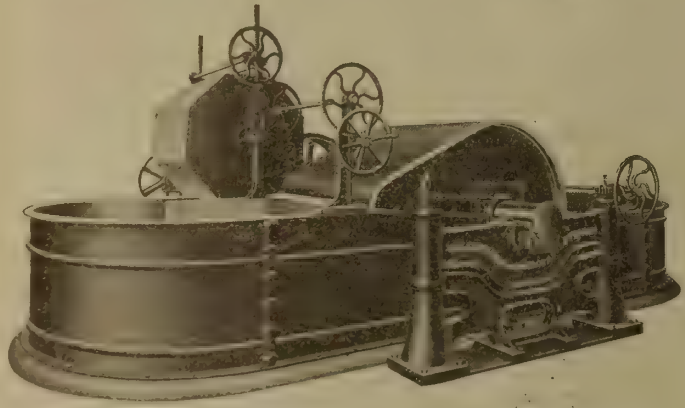

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All Standard Forms *Many Special Designs*

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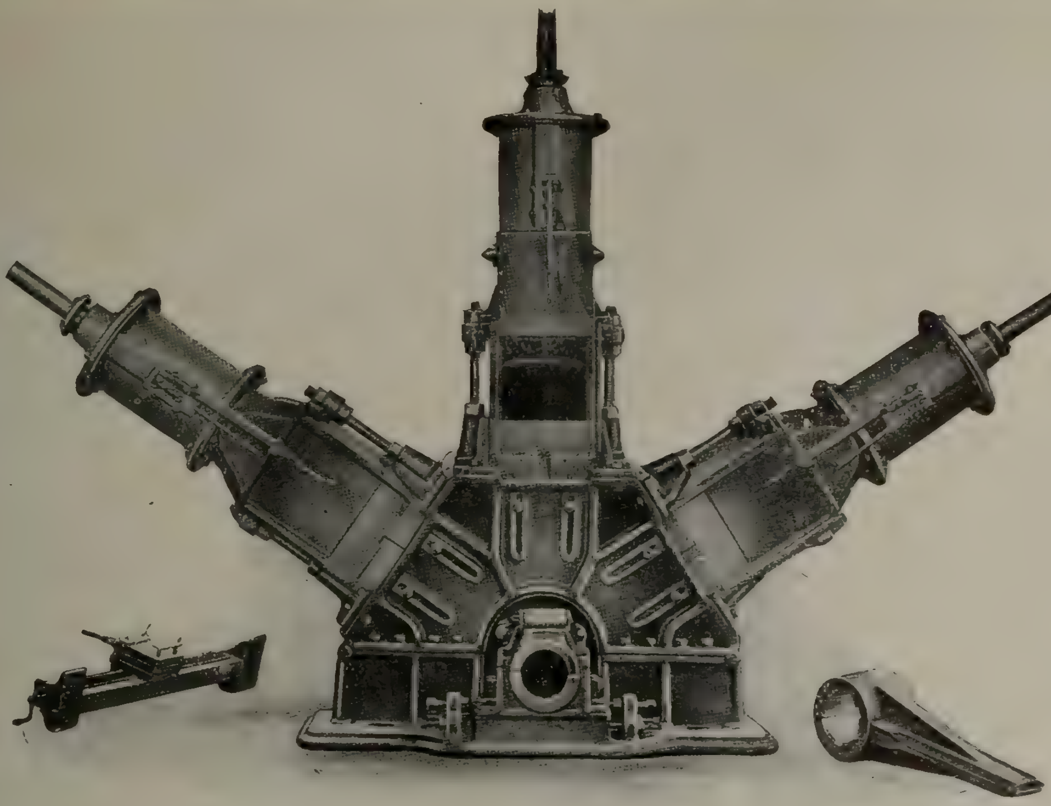

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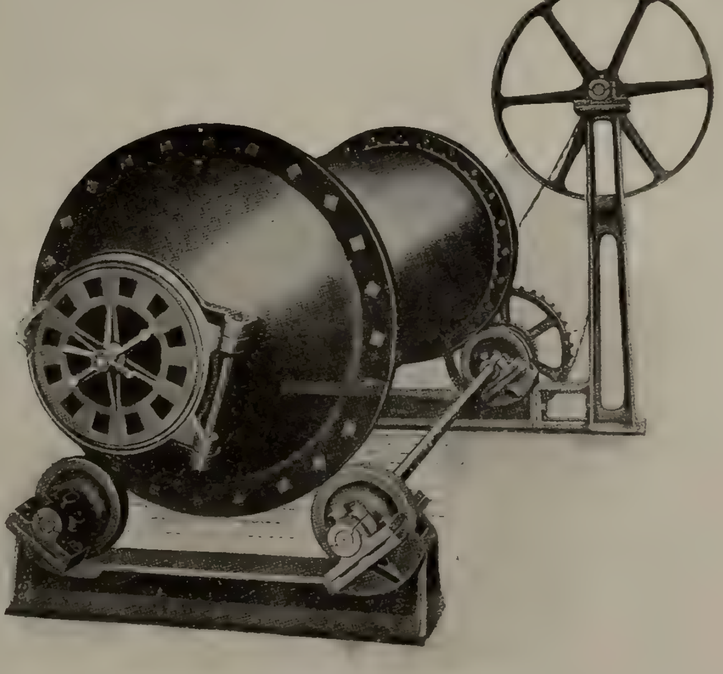
Manufacturers of

Grinders, Wet Machines, Screens and Sulphur Burners.

Full Specifications and Prices furnished on application.



Rotary Sulphur Burner

Interior of the MACHINE ROOM of MESSRS. EDWARD LLOYD, LTD., SITTINGBOURNE, ENGLAND, containing the last two machines supplied to this Company by Chas. Walmsley & Co., Ltd.

These "Walmsley" Fast News Machines are 175 inches wide, and are making paper at OVER 600 FEET PER MINUTE, with an OUTPUT OF 500 TONS NEWS PRINT WEEKLY. The machines are equipped with the Lloyd and Hutchison Patent Drive. This patent device is controlled by Walmsley & Co., Ltd., and dispenses entirely with Friction Clutches and Gear Wheels.

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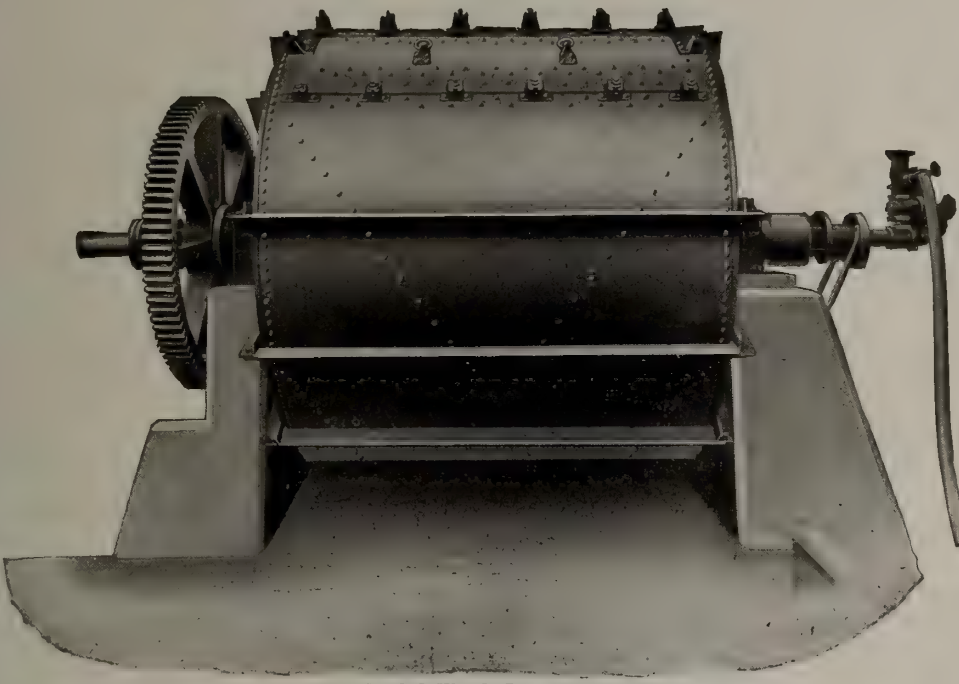
This Barking Drum affords the means of an immense saving in barking wood for pulp mill process



The BACH-WIIG Barking Drum

In this machine the bark is removed by the action of friction and water, therefore there is absolutely no loss of wood, shrinkage in cubic measurement being confined entirely to the percentage of bark. Tests made against the knife barker have shown the following results:

The Loss with the Barking Drum		Loss with Knife Barker	
Round wood covered with bark	8%	Round wood covered with bark	22 to 24%
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Loss with edgings on knife barker not given as it is well known they cannot be handled practically on knife barker, so really the savings on edgings is their comparative value for fire wood or for pulp wood

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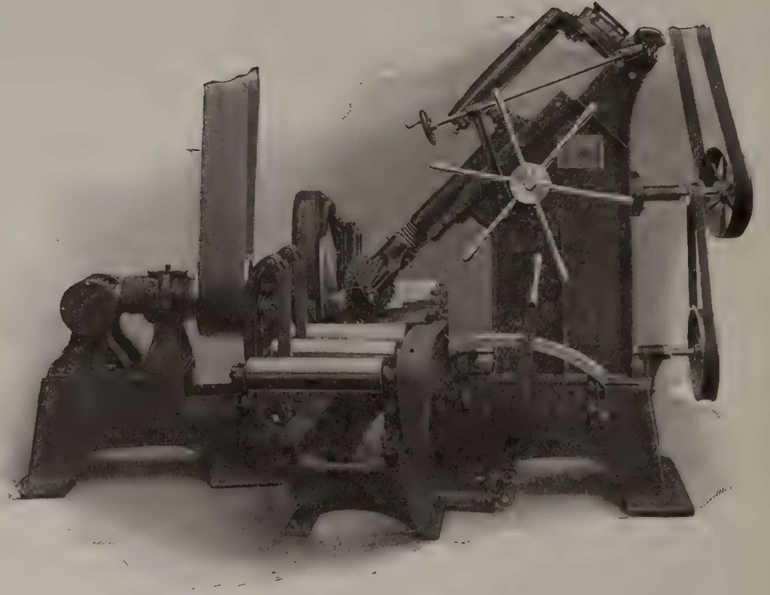

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All Widths

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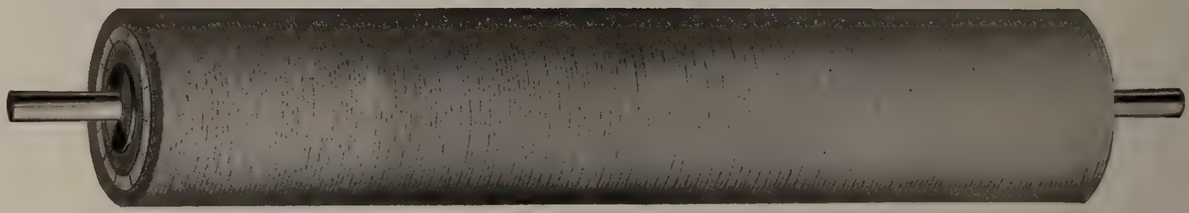

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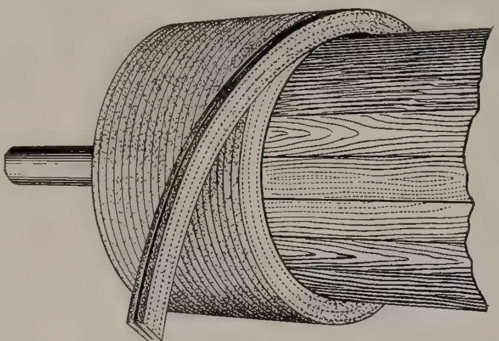
THEY KEEP ELASTIC
THEY ARE RIGHT IN PRINCIPLE AND MAKE GOOD IN PRACTICE



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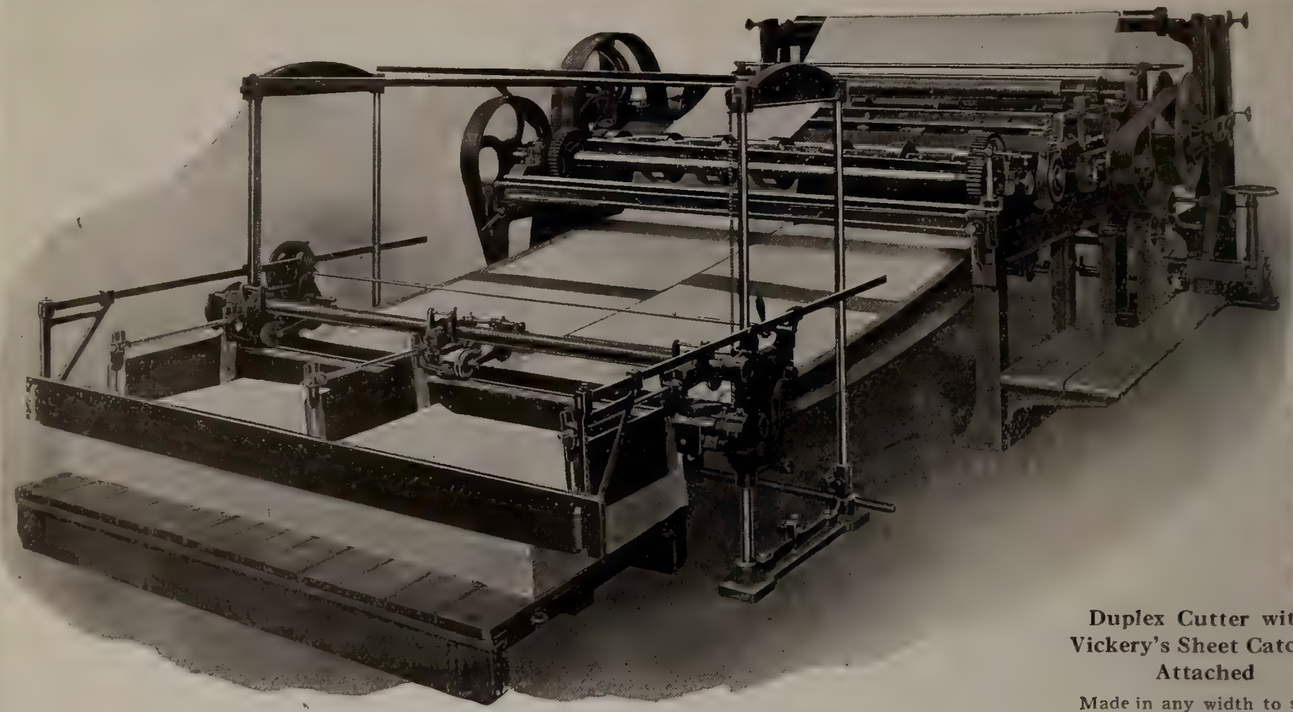

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Made in any width to suit
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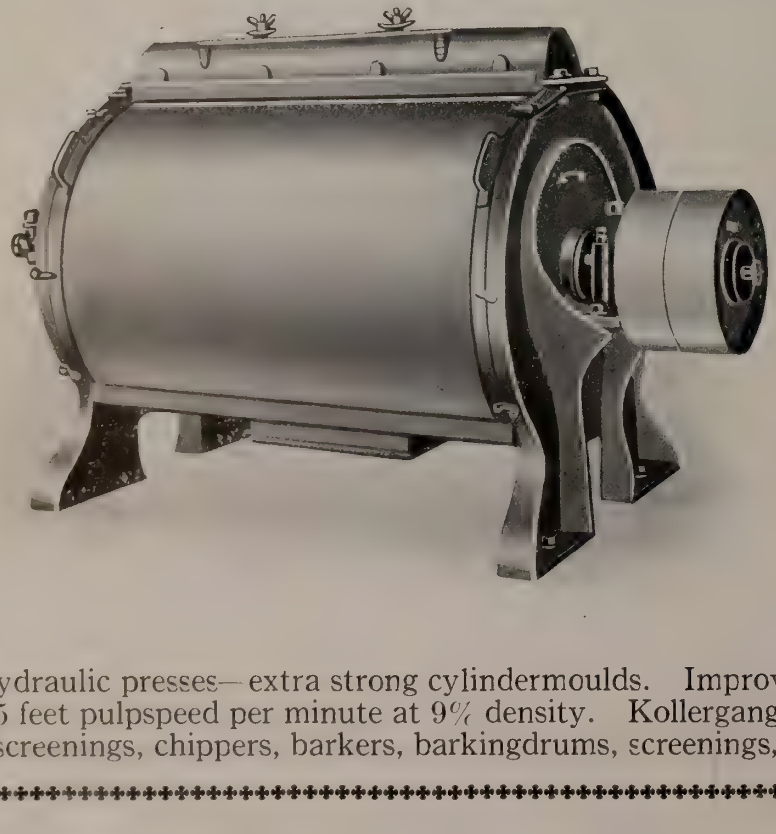

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Patented in Canada and
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4 Screens	Albt. Reed & Co., Newfoundland.
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Manufacturers of Woolen Felts and Jackets for all kinds of Paper and Pulp.
Strong open Gray Felts for high speed news machines and Gray Pulp Felts for Ground Wood and Sulphite.
Lowest cost per ton of product. Very heavy Jackets for long rolls of large diameter.

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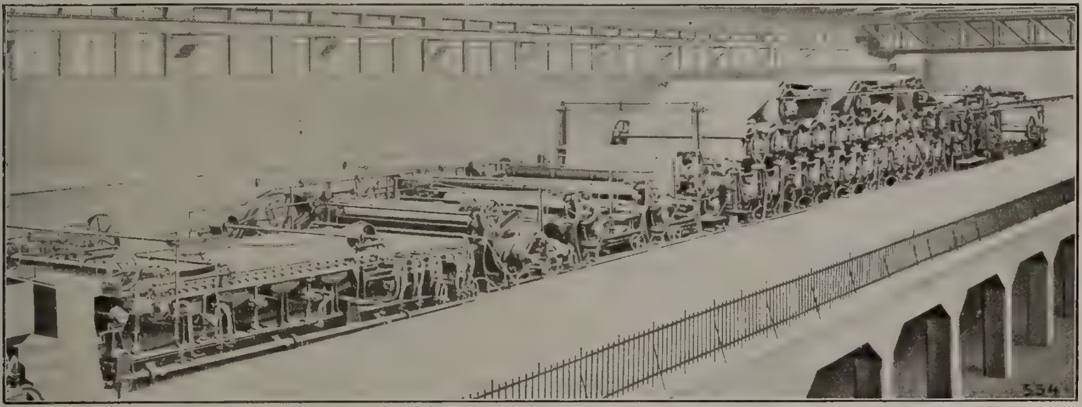
Specialties: Construction of all machines and complete installations for paper, cardboard, pasteboard, cellulose, and woodpulp plants



Installed modern paper machine, 3900 millimeters wire width, about 200 meters per minute working speed.

Paper machines for all kinds of Paper, Glue machines, Cardboard machines, Pasteboard machines, Cellulose Drying machines, Calenders, Cutting machines, Roll machines, Edge-Runners, Refiners, Core mills, Pumps, Strainers, Patented Fullner Filter, Conical Pulp Saver, Roll Grinding machines, Giant Grinders, Centrifugal Sorting machines, Woodpulp Drying machines.

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SPECIALTIES:

Modern High Speed News Paper Making Machines
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The New "Marshall" Patent Refining Engine
with separate adjustment to cones and discs, and our patent Ball Thrust Bearing

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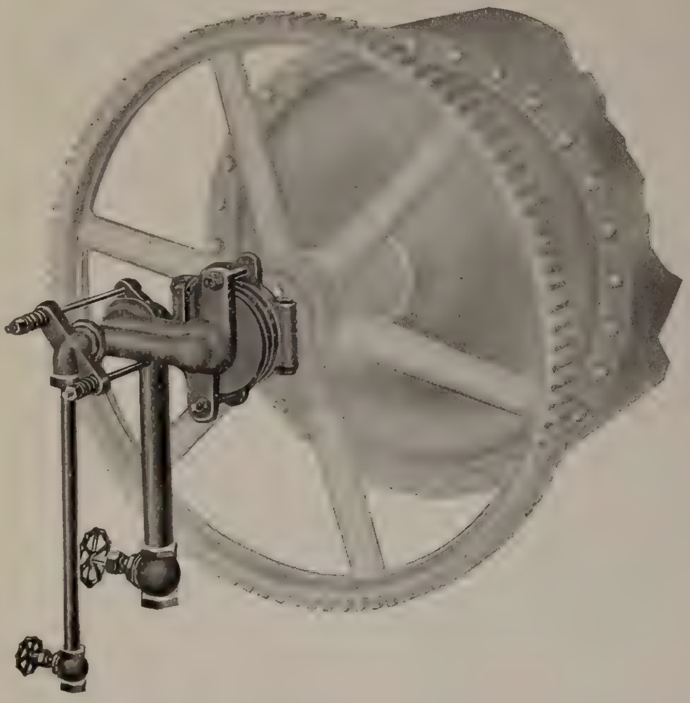

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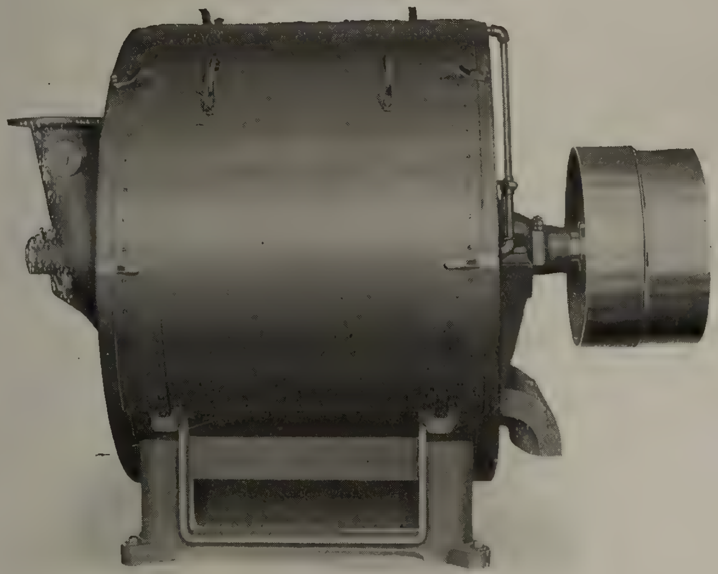

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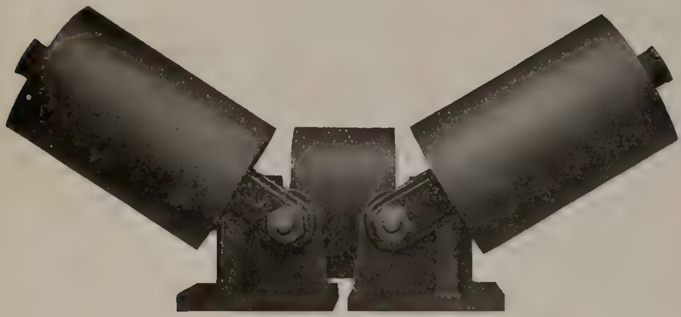

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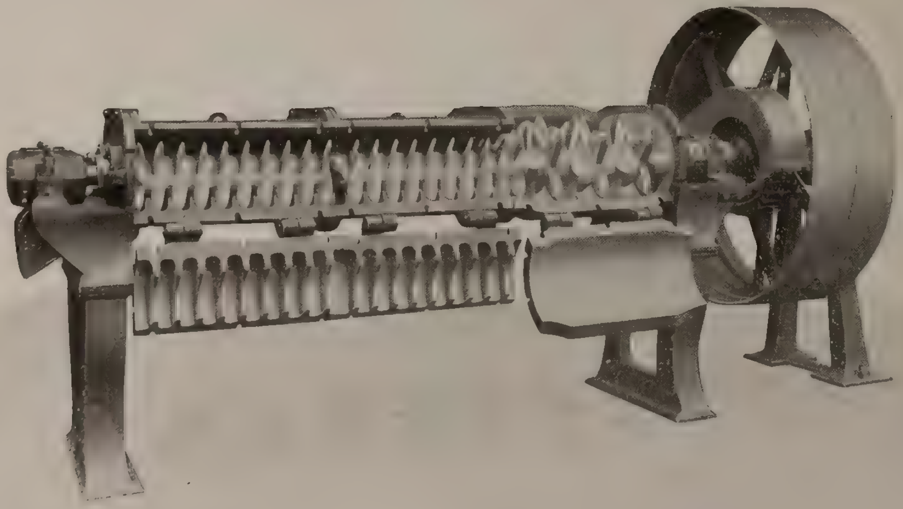

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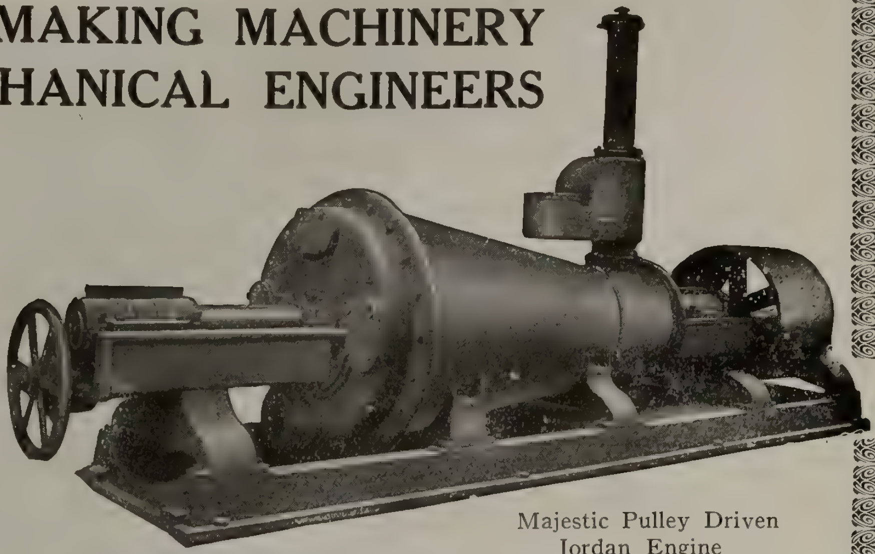

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We manufacture three sizes of Jordan Engines, either belt or direct connected motor driven, fillings of Wagg's steel or stone type, 3-part or plain

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Solid Steel, Forged,
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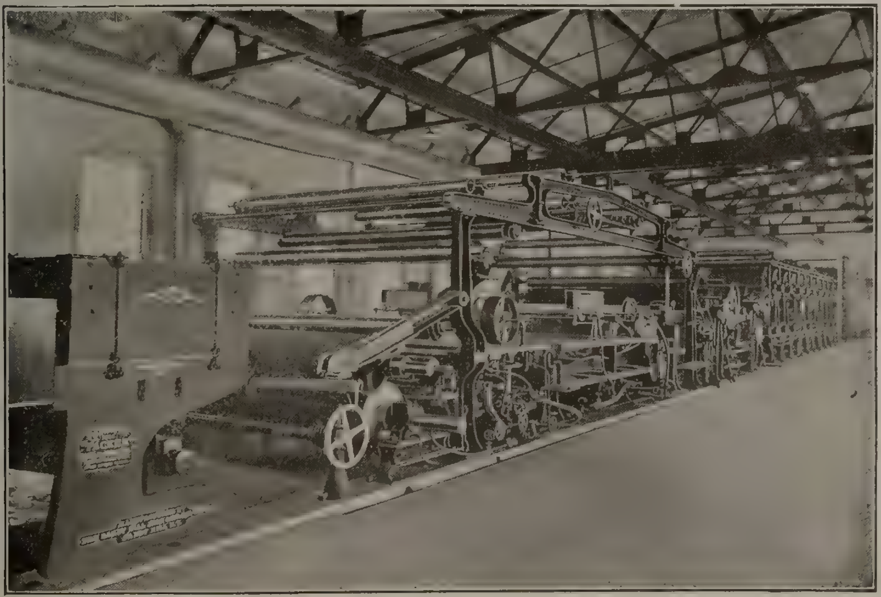
Patented Wooden Sectional Suction Box Covers. Warner's Patent Metal Sand Catcher for Beating and Washing Engines



Harper Fourdrinier Paper Machine

Send for our bulletins describing this machine

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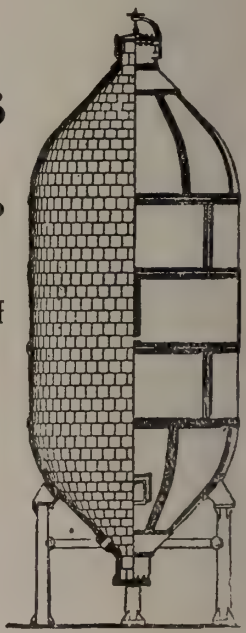
Brannan Patent Paper Folders
Stuff Chests, Horizontal and Vertical
Stuff Pumps, Single, Duplex and Triplex
Dillon Patent Calender Doctors and Feeds
Cutter Knives and Slitters



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Lining for Sulphite Digesters

TOTAL THICKNESS ONLY 2½ TO 2¾ INCHES

Resists the action of the acid and ensures absolute protection to the Digester Plates.
Great durability, therefore large saving in upkeep and repairs.
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Extensively adopted by Scandinavian and Continental Mills.
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Full Particulars and Prices on application to SOLE MANUFACTURERS

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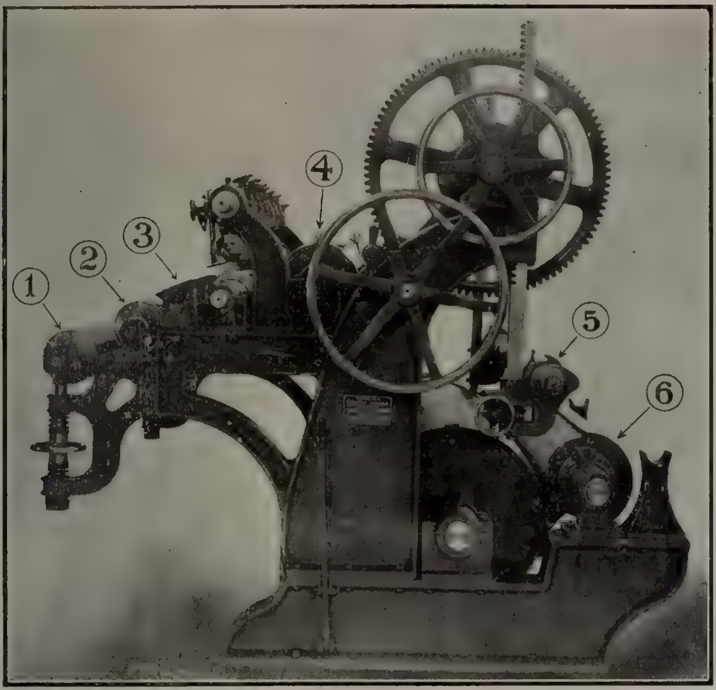

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Double Drum Winder

With Slitter Attachment Combined

REFERENCE TO NOS.:

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3—8in. Adjustable Draw Board
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5—Adjustable Core Shaft Box
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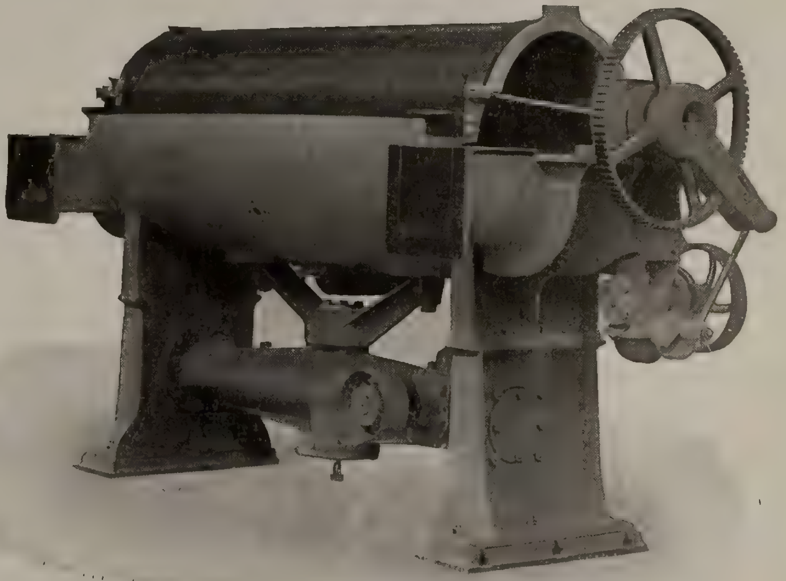
Patent Full Drum Strainer



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Pulp and Paper Magazine

OF CANADA

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"Safety First."

The "safety first" movement has attracted much attention all over the continent and perhaps no movement has been more worthy of earnest consideration from employers and employees alike than this. The result is that in practically every line of industry we now see a tendency towards showing more consideration to human life and human welfare, more consideration for the lives and conveniences of the workmen and on all sides steps are being taken to minimize the danger of accident by various means. Workmen's compensation laws are recognized as necessary legislation in all industrial countries and laws compelling employers to provide safeguards over all danger points in machinery and elsewhere are now recognised as being a necessary part of our industrial activity.

In the paper industry, the field for such a movement as the safety first movement is great, perhaps larger than most employers and employees realize. In the first place, with the complicated machinery necessary the shaftings, belts, etc., and the "green" help that manufacturers are now compelled to employ on account of the scarcity of suitable labor the danger from accident is made apparent. Although the machinery that is now being placed on the market has most of these danger points guarded, this is not found to be the case on the older makes of machinery and employers do well to see that this condition is rectified. The lives of workmen are too valuable to be risked unnecessarily and manufacturers will be serving their own interests by providing safety devices in all such cases.

The safety first scheme can be worked to advantage in every department of the mill and every operative can be instrumental in its advancement and in the minimizing of danger, either to body or health. No matter what room one enters in a mill one can see workmen taking unnecessary risks, cleaning machines when they are running, or oiling intricate parts when they are in motion, or some such unnecessary operation. These are all risks that endanger the lives of the operative and establish a precedent, in that new help will probably follow the example, and when the accident occurs, as it most surely does sooner or later, the employer is compelled to pay a compensation. It is surely up to the workmen to exert every effort to minimize danger and also to every old hand to set a good example in this regard.

Linked with this feature of safety first is the interest the employer should show in the welfare of his workmen, both in and out of the shop. Safety first means safeguards to health and happiness as well as safeguards from bodily injury, and the employer who is interested in this manner is serving his own interests as well as the interests of his workmen. The efficiency and reliability of his workmen is a principal consideration, one that should occupy the attention of every manufacturer. The contented workman is the one who will be most efficient and reliable and contentment is only gained by making working and living conditions as safe and as pleasant as possible.

The series of pictures in this issue show many interesting guards throughout the mill.

The "safety first" movement embraces every branch of industry, and has, as its object, the reduction of the number of accidents among industrial workers. It may be said to consist of two parts. The first deals with the use of all kinds of safety appliances and the second, with the prevention of accidents by the education and co-operation of the employees. In Canada, the Provincial Factory Inspection Acts and Mine Regulation Acts, to a certain extent, deal with the former, but, as yet, little has been done by corporate enterprise with regard to the latter.

The movement originated with the United States Steel Corporation, and, up to the present time, it owes its effectiveness and achievements almost entirely to corporate enterprise. The co-operation of the men has also been obtained to a marked extent, chiefly by the formation of "Safety First" committees on which the men are represented and which make suggestions concerning the work. Rewards are given when suggestions are adopted and, in the case of the Steel Corporation, the majority of the most useful hints have come from the employees. The "safety first" policy has also been adopted by many of the Canadian and American railways and has been the means of effecting a marked diminution in the number of accidents. During eighteen months of its operation on the Chicago and Northwestern railway there has been a reduction of 51½ per cent of the injuries. In the case of the Steel Corporation a reduction of 43 per cent in the annual loss from accidents has been effected. Financially this represents a saving of over $2,000,000 to the country, and, at the same time, a gain in working time to the company.

In Germany and in the United States, National Safety Bureaus and Museums have been established for giving information concerning safety appliances and for exhibiting the same.

It is pleasing to note that in July the Canadian Copper Company appointed a safety engineer in connection with a "safety first" policy for their mining and metallurgical plants. Although well trained rescue corps have been established in coal mines in Canada for the prevention of certain classes of mine accidents, this is the first step in the "safety first" movement among metal mines in Canada.

Mill Waste in Streams.

Large volumes of misguided discussions are appearing at the present time in Journals and Magazines throughout the country objecting to the pollution of streams by pulp mills. The editors of these journals seem to be going on the theory that any liquid going into the stream must necessarily be detrimental. As a matter of fact, there are hardly any instances in Canada where mills are seriously affecting streams or rivers into which the discharge goes. A great many rivers into which such mills are dumping their waste have far more serious contamination from other sources and, for mills of the size we have in Canada, there are very few streams which would be affected by this disposal. In a very small stream if the waste liquor is not treated at all, it does effect the fish in the stream, but practically all our pulp mills are in such positions that this waste is so diluted that it has no effect. There has never yet been found in this country an instance where a stream really suffered from the pollution of a pulp mill. Of course, we all look with eager anticipation to the time when someone will discover better methods of utilizing the waste from sulphite mills, but up to the present time this happy hope has not been realized. Although many scientists of world-wide repute have spent their lives working on this problem, no solution has been obtained. It is true that in some foreign countries alcohol is being made from the waste liquor, but this is of no assistance in the pollution of the streams as the liqour after the manufacture of alcohol is just as detrimental as before. Unless there are cases where the liquor is affecting streams such as might be the case of a large mill on a small stream, the problem of pollution is nothing more than an attempt to cater to public opinion and secure attention for the paper making the howl. The paper trade in this country is polluting the streams far less than any other large industry.

In this connection there is now before the House of Commons a bill respecting the pollution of Navigable Waters, which reads as follows:

> 1.—No person shall put or deposit, or cause or permit to be put or deposited, or to flow or be carried, any sewage, offal or refuse, or any matter that is poisonous, noxious, decomposing, refuse or waste, into any navigable water or into any such water that flows into any navigable water, unless such matter is disposed of in accordance with regulations made under the authority of this Act.
>
> 2.—Every municipal corporation convicted of an offence against this section shall, upon summary conviction, be liable to a fine of not less than five hundred dollars and an additional sum of fifty dollars for each day during which the offence continues.
>
> 3.—Every corporation, other than a municipal corporation, convicted of an offence against this section shall, upon summary conviction, be liable to a fine of not less than two hundred dollars and an additional sum of twenty dollars for every day during which the offence continues.
>
> 4.—Every person, other than a corporation, who is convicted of an offence against this section shall, upon summary conviction, be liable to a fine of not less than fifty dollars

and an additional sum of ten dollars for each day during which the offence continues, or to imprisonment not exceeding two months, or to both fine and imprisonment.

2.—The Governor in Council may make such regulations as are necessary to carry out the purpose of this Act, and such regulations shall be carried out and enforced by the Director General of Public Health, and shall have force and effect as and from the date of their publication in 'The Canada Gazette.'

3.—Where, at the date of the passing of this Act, any sewage or matter referred to in subsection 1 of section 1 of this Act flows into any navigable water, or into any other water which flows into any navigable water, this Act shall, in the case of municipal corporations, come into force two years after it is assented to by the Governor General, and in the case of other corporations and of persons shall come into force six months after such assent.

It is to be hoped that regulations made under the Act will be such as to allow of reasonable application in which case the paper industry will be the first to co-operate.

American Labor Organisers Have Eye on Canadian Paper Mills.

Ever since the passage of the new American tariff, there have been continuous rumours of interference from the American labor leaders in our Canadian industrial life, especially in the paper trade. We have reported from time to time in our new columns the instances of the visits of some of the leaders to this country, but we are now able to say on good information that an organized effort is being arranged in the United States to come to this country and organize all the paper mill workers. The recent labor troubles in British Columbia, which were investigated and supported entirely by labor interests to the south, shows us what an undesirable condition this would be. Aside from the question of the merits of organizing Canadian pulp and paper works, there is no doubt that it is a serious thing to have organizers whose interests are not in this country come over here and dictate to our workers. These men believe that a great deal more paper will be manufactured in Canada in the future and shipped to the States and it is their purpose to put the usual tax on this paper and force it to support the international labor organizations which have meant an enormous drain upon the workers. The conditions in the pulp and paper mills in this country are far better than similar conditions in the United States where all the paper mills have organized labor. We do not need at the present time such an organization to better the conditions of our men in the mills. We have equally good conditions with equally good wages without the troublesome Union. Our workers are able to earn the same wages without having to pay a large tax every year to support labor officials in luxury and in many cases in indolence. It is not because the unions of the United States feel that the conditions under which Canadian workmen are working are not as they should be, but it is simply from a desire to have their finger in the pie and dictate to Canada, that they are taking this step and coming to this country. We think that Canadians in every walk of life should resent extremely this interference from outside sources. If the men in the paper mills want to organize, that is a matter which they should themselves be thoroughly competent to decide on and to execute, in case it was thought desirable, but to have an official representing labor of a foreign country come here to raise trouble among our workers is a serious situation. We hope that all workmen and mill officials will resist to the uttermost such outside interference.

Editorial Comment.

In Sweden attempts are being made to produce ethyl alcohol from sulphite liquors and the results are said to be quite satisfactory, but while these are steps in the right direction, the great problem affecting these industries still remains unsolved. Continuing, Dr. Wagner said:

"In this connection I do not think it amiss to point out another incongruity of laws as enforced in various countries and the discrimination shows against certain products. One of the greatest wastes in this country is that of the lumber industry. The waste in that particular industry is appalling and when we recall the strenuous efforts toward conservation of our natural resources, one stands aghast at the wanton waste still going on in that industry, for wherever you see a lumber mill of large capacity you will invariably find a burner installed where such wood waste as cannot be used in the production of steam is incinerated, and millions of dollars worth of material escapes unused into the air in the form of gases.

"During the last few years an industry has been started in this country based upon the observation that cellulosic materials can be converted into reducing sugars, from which ethyl alcohol may be produced. There is only one plant in operation thus far, but the results obtained seem to indicate that this new method of producing ethyl alcohol is commercially feasible and lucrative. The cash capital invested in this plant amounts to $1,000,000. The product obtained is of the very highest grade, practically free from fusel oils.

CHEMICAL UTILIZATION OF SOUTHERN PINE WASTE

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The following article is the dissertation covering two years work on the manufacture of pulp and paper from resinous woods. The results here outlined will revolutionize the use of these woods. This article is published exclusively by the author in the Pulp and Paper Magazine.

Practical Experiments.

A series of experiments was next undertaken on a somewhat larger scale to approach a little more closely the conditions which would be met in commercial operation. The aim was to prepare the wood in the form of chips of the ordinary pulping size, then to subject the chips to a mild preliminary steaming in dilute alkali to recover the rosin and turpentine, and finally to cook the extracted chips in stronger alkali in the usual way for pulp. The preliminary extraction was studied to determine the conditions for complete solution of the rosin and simultaneous distillation of the turpentine without too serious an attack of the wood itself. The draining of the alkali extract from the chips and the salting out of the rosin soap by subsequent addition of excess caustic soda were carried out with conservation of alkali in mind, as well as high recovery of rosin soap. The second stage of the process—the production of pulp from the extracted chips—was carried through only to note any possible deleterious effect of the preliminary steaming on the quality or yield of the final pulp. The experiments were designed to throw light on the problem of commercial feasibility rather than to establish exact practical data.

The wood studied was limited to box-face slab material. As no pulp-wood chipper was available, the cleaned slabs were reduced to chips by sawing in short lengths of about one inch and splitting as uniformly as possible. Fine material was eliminated and the chips were reduced to an average size of about 1⅛ in. x ¾ in. x 3-32 in., the thickness (3-32 in.) being the dimension held most rigidly within narrow limits. These chips were considerably longer than the smallest commercial size, and, as penetration of wood proceeds most readily along the grain, the conditions for alkali extraction were certainly as severe as industrial practice would necessitate. The chips used in Experiment 6 were prepared from the main supply by reducing the size to approximately 1⅛ in. x ¼-¾ in. x 1-16 in. The main supply of chips was thoroughly mixed and a representative sample obtained for analysis by quartering and subdividing. The chips were stored in stoppered bottles to prevent loss of turpentine and moisture, while the sample was used to determine the composition of the wood.

Composition of Wood.

The rosin content was determined by thoroughly extracting 25 gram portions of the very fine chips with ether in a Soxhlet extractor fitted with ground-glass connections. The rosin was finally dried to constant weight by heating in a Freas electric oven at 105°. Occasional rolling of the flasks hastened the removal of the ether and Turpentine. Checks within one or two tenths of a percent were considered satisfactory.

By drying the above chips at 105° after extraction with ether, a figure was obtained representing the percentage of "actual wood"—free from moisture, rosin and turpentine. This value has been used in computing the true pulp yields.

To determine the effect on the rosin of extraction by alkali, weighed quantities of the sample chips were heated near the boiling point in dilute caustic soda solution. By repeated decantation and heating with fresh caustic, there was ensured complete saponification of the rosin and thorough washing of the chips. The combined fractions thus obtained were precipitated with acid and the rosin extracted with ether. To minimize the tendency towards emulsification of the humus and to make the operation as simple as possible, the alkaline liquor was placed in a separatory funnel, acidified with HCl or H_2SO_4, and shaken with ether while still slightly warm. The suspension of humus between the water and ether layers prevented complete removal of the lower aqueous layer, although the greater part could be drawn off directly. The clear, upper portion of the ether extract was decanted through a small plug of absorbent cotton into a second separatory funnel. The residual gelatinous humus was then washed several times by decantation with fresh ether and finally filtered on the cotton and washed with solvent. The small quantity of water was then easily removed in the second separatory and the rosin was determined in the usual way. This cycle gave values for rosin which were a few tenths of a percent lower than the direct ether figure. Possible decomposition of gums by the caustic and slight mechanical losses of rosin during recovery may explain this discrepancy. Previous tests had shown that a trace of humus was dissolved by the ether, but this amount was not enough to appreciably affect the rosin determination.

The alkali-extracted chips, after thorough washing with water, were dried, weighed and extracted with ether. Only a faint trace of resinous material was obtained on evaporation of the ether, showing that the alkali had completely dissolved the rosin. The weight of the extracted chips varied from 45 to 50 per cent. of the weight of the original wood, whereas the actual wood content was found to be over 54 per cent., as determined by direct ether extraction of the wood. The discrepancy indicates the extent of lignin decomposition by the alkali.

The percentage of volatile oils could not be accurately determined on a small scale, so the highest yield obtained in the subsequent steaming experiments had been taken as a close approximation of the true "turpentine" content of the doow.

In experiments 5 and 6, 1,500 grams of wood yielded 145 cubic centimeters of turps., weighing approximately 126 grams on the basis of 0.87 specific gravity. (Actual specific gravity—0.8743 at 15°C.) This shows that the wood contained close to 8.4 per cent. by weight of volatile oils.

The average composition of the wood supply was found to be as follows:—

Actual wood	54.3%
Rosin (by ether)	32.1
Volatile oils	8.4
Moisture (by diff.)	5.2
	100. %
Rosin (by NaOH)	31.8%

The total oleoresin amounted to 32.1 + 8.4 = 40.5 per cent, made up of 79.2 per cent rosin and 20.8 per cent bolatile oils.

Apparatus.

The digester used in carrying out the extraction and cooking of the wood was made from an extra-heavy cast iron tee, 6 in. x 6 in. x 4 in. The apparatus was supported in a horizontal position by resting the flanges in two concrete yokes. The 4 in. outlet of the tee was turned upward to act as a dome for the collection of steam and turpentine vapor; this arm was also used for charging and discharging. The digester was equipped with thermometer pocket, pressure gage, and relief line controlled by a needle valve and leading to a glass condenser. An internal stirring device, consisting of a small shaft fitted with arms, allowed mixing of the contents of the digester when desired. As condensation was too great when the digester was heated by live steam, heat was furnished by two large circular gasburners.

Manipulation

The manipulation was much the same in all the experiments. For the preliminary extraction, from one to two kilograms of resinous chips were placed in the digester and covered with a measured volume of alkaline liquor, containing the desired amount of NaOH or Na_2CO_3. It was found that considerable space had to be left for steam collection on account of the tendency towards foaming. The top flange was then securely bolted in place, all necessary connections were made and the burners started. In about an hour there was evidence of pressure and the relief line was opened to permit steam distillation of the volatile oils. The burners were controlled to maintain a fixed, low pressure (between 15 and 30 pounds) for extraction of the rosin.

Agitation was carried on continuously or intermittently to prevent local overheating and to facilitate solution of the rosin. Continuous stirring tended to fray the chips and render them less suitable for pulping.

The turpentine fractions were in most cases isolated every fifteen minutes during the relieving period. Curves are given showing the rate of evolution of the volatile oils and the changes in refractive index and specific gravity during the course of distillation for typical experiments.

After the preliminary treatment no longer yielded turpentine in measurable amounts, the burners were removed and the pressure drawn down. The digester was then inverted by rotating in its seat and the hot liquor drained through the relief line.

The "direct extract" was dark brown in color and the rosin was in perfect solution. For analytical purposes the liquor was aliquoted. This presented some difficulties; the liquor had to be kept hot to prevent precipitation of the rosin soap and the syrupy solution was not easy to handle. Some of the aliquot portions were strengthened while hot with additional caustic soda to make the precipitation of resinate more nearly complete. On cooling, the direct extract gave bulky precipitates of fairly white rosin soap. The dark, supernatant liquors were decanted and drained through cotton or filter paper, and analyzed for unprecipitated rosin. The soap, more or less contaminated with humus and liquor, was dissolved in water and the rosin determined in the usual way.

The chips retained from one to one and a half times their weight of liquor after draining. This represented a serious loss of rosin. In order to recover most of this soap, the chips were washed by covering with hot water and boiling for some time. The "first wash liquor" was drained as before, cooled and aliquoted for determination of rosin content. The color of the solution was dark brown. No soap precipitated on cooling, although about 90 per cent could be precipitated by strengthening moderately with caustic soda.

To further clean the chips enough to allow sampling and careful examination, the wood was washed a second time by boiling with fresh water. This "second wash liquor" contained but little rosin. In actual practice the chips would be ready for the introduction of pulping liquor after draining the first wash liquor from the digester.

The extracted chips after washing as above were discharged from the digester and allowed to dry somewhat. The chips had been appreciably softened by the alkali and darkened by partial attack of the lignin. After thorough mixing, the weight was taken and the mixture sampled. The sample was reduced to small chips and boiled with successive portions of water to remove the last traces of sodium resinate. This final washing yielded small amounts of rosin soap. The chips were then dried in the oven and extracted with ether to determine the percentage of unsaponified rosin left in the wood. This indicated the efficiency of the alkali extraction.

The sample of chips was finally dried at 105°C. and weighed giving the percentage of dry, rosin-free wood. The difference between the true wood content of the original resinous material and the weight of the wood after alkali extraction showed the extent of solution of the lignocellulose.

The second stage of the treatment was the production of pulp from the wood. The main portion of the chips, after alkali extraction and washing, was returned to the digester for the soda cook. Caustic soda solution was added to cover the chips and provide amounts of Na_2O varying from 15 to 35 per cent of the weight of the wood.

A gage reading of 100 pounds was reached in 1-1½ hours. The pressure was held at this arbitrary value for about three hours to obtain satisfactory disintegration of the wood. The preliminary treatment had already dissolved some of the lignin, so the final cooking was comparatively short.

The contents of the digester were agitated by stirring frequently. Distillation was carried on at intervals to detect any further evolution of turpentine. Only a few drops were obtained, except in those cases where preliminary extraction of the rosin had been incomplete.

At the end of the cook the pressure was drawn down, the hot liquor drained off and the pulp washed thoroughly. To determine the yield, the pulp was pressed carefully sampled, and the aliquot portion dried at 105°C.

The pulp was refined in the beater, samples being taken at intervals and made into sheets.

Outline of Experiments

Experiment 1 served primarily to standardize the apparatus. 2,000 grams of wood and 7,000 c.c. of liquor allowed about 1,000 c.c. free space in the dome of the digester for steam collection. This was found to be insufficient, due to surging over of the alkaline liquor. Contamination of the turpentine distillate by alkali and rosin soap not only resulted in a loss of rosin but also caused more or less retention of turpentine in the aqueous layer. The chips were heated with a 3.4 per cent NaOH solution (2.6 per cent Na_2O), the total caustic being 3.2 times the amount theoretically necessary for the saponification of the rosin. A steam pressure of 20 pounds was maintained for 3.5 hours. Although the bulk of the turpentine was removed in the first hour, the fullness of the digester prevented efficient recovery of the least portions in the time allowed. On examination of the chips it was found that considerable rosin still remained unsaponified. In the soda cook a 4.1 per cent. NaOH solution was used, providing a ratio of Na_2O to wood of 24 per cent. A pressure of 100 pounds for 2¼ hours failed to give proper disintegration of the wood fibre.

In Experiment 2 the digester was filled only about two-thirds full and a very small excess of caustic soda (1.6 times theory) was used. Distillation was carried on at 30-40 pounds in an attempt to hasten the evolution of the turpentine. After two hours the fractions became very small and steaming was discontinued at the end of 3 hours. Conditions for turpentine evolution were particularly favorable on account of the large free space left in the digester and there was no contamination of the distillate. However, the yield of crude turpentine (41.3 gals. per cord) was lower than in subsequent runs and a large proportion of the rosin was left in the chips in the free state. Titration of the liquors showed that the caustic had been completely neutralized during the preliminary extraction, which explained the imperfect penetration of the wood. This pointed to the necessity of employing a larger excess of alkali in order to take care of neutralization by the humic acids formed. The soda cook was carried on with 2.6 per cent. caustic solution. The maintenance of high pressure for 4 hours gave a soft pulp, the yield being 22.5 per cent of the original wood and 41.5 per cent of the actual wood contained therein.

In Experiment 3 the proportion of caustic soda was raised to a little over twice the theoretical amount for saponification and distillation of the turpentine was carried on for 4 hours at 25-30 pounds pressure. Disintegration of the rosin was sufficiently thorough to allow a high recovery of turpentine (44.6 gals, per cord), but an appreciable amount of rosin (7.8 %) remained unsaponified. Analysis of the liquor after extraction showed an absence of excess caustic, indicating that the proper alkali ratio had not yet been reached. The weight of the extracted chips was found to be 44.8 per cent of the original resinous wood, so that the decomposition of the lignin and other non-resinous constituents of the wood had amounted to 9.5 per cent of the original wood or 17.5 per cent of the "actual wood". In this experiment for the first time careful attention was paid to the distribution of the rosin. The direct extract contained 66.2 per cent of the true rosin content in the form of rosin soap. By direct cooling only 72.7 per cent. of this soap was precipitated, due to the marked solubility in the faintly alkaline solution. On strengthening the liquor to 8 per cent. NaOH, however, 96 per cent of the soap was deposited, representing 63.5 per cent of the total rosin in the wood. The first wash liquor contained 11.7 per cent of the total rosin and the second wash liquor an additional 2.9 per cent. The chips retained 7.8 per cent of the rosin in the free state and about 3 per cent more in the form of soap which had escaped the first two washings. A small amount of soap was found in the aqueous distillate, while the balance (about 7 per cent) represented decomposition by the alkali and slight mechanical losses. Final steaming of the chips in 5.4 per cent. NaOH for 3½ hours yielded 41 per cent, of soft, thoroughly disintegrated pulp.

To determine the effect of stronger caustic soda, a ratio of 4.34 was used in Experiment 4. Extraction of rosin was in this case complete and the recovery of the turpentine was accomplished more quickly. A large excess of NaOH remained after extraction and this experiment probably represents the upper limit as far as alkali to wood is concerned. The direct extract contained 77.2 per cent of the total rosin, 97 per cent of which was precipitated as soap on addition of excess caustic soda. Only 0.15 per cent. of the rosin content of the wood remained unsaponified in the chips. The stronger caustic occasioned solution of 24.1 per cent. of the actual wood content. The second stage of the process gave a yield of 41.8 per centpulp, the fibre being still softer than desired.

Experiment 5 is undoubtedly the most typical of the series. A lower ratio of Na_2O (3.47) was found to be entirely satisfactory. The main extraction was carried on at the lower pressure of 15 pounds and an examination of the turpentine curve in Figure 2 will show that higher pressures are apparently not necessary in obtaining rapid distillation of the volatile oils. The time under pressure was purposely lengthened to 4 hours and the pressure finally raised to 20 pounds to ensure a maximum yield of turpentine. The percentage calculated from this run has been chosen as representing the true "turpentine" content of the wood. Extraction of rosin was practically complete and considerable excess of caustic was present in the liquors. The direct extract contained 74.5 per cent of the total rosin and the first wash liquor an additional 11.2 per cent.

Special attention is called to the fact that in this experiment the chips were finally cooked according to the procedure suggested for industrial application. The main portion of the direct extract was strengthened with a calculated amount of caustic soda to precipitate the rosin soap more completely. The black supernatant liquor was then used for the soda cook. The pulp so obtained was in no way inferior to the fibres from the other runs. The yield was 46.4 per cent of the actual wood. The pulp retained the general chip form, but was easily disintegrated by hand and after beating was readily made up into uniform sheets of favorable strength and color.

Experiment 6 represents a run on smaller chips to ascertain the differences in alkali penetration. A batch of larger chips from the main supply was reduced by splitting to an average size of about $1\frac{1}{8}$ in. x $\frac{1}{4}$-$\frac{3}{4}$ in. x 1-16 in. These chips were about half the thickness of those in the other seven experiments and might be difficult to obtain on an industrial scale without sacrificing uniformity. However, it would be entirely practicable to use chips smaller than those of the main supply and Experiment 6 indicates the general variations with the finer material.

The wood was treated practically the same as in the preceding experiment. The amount of caustic soda was reduced to 3 times that theoretically necessary for saponification and distillation was carried on at the lowest feasible pressure (15-20 pounds). It was found that the last portions of turpentine were removed more readily than with larger chips and the time of preliminary treatment was materially shortened, due to the more rapid penetration of the alkali to the interior of the chips. There was no appreciable difference in extent of lignin decomposition, the loss in weight sustained by the "actual wood" (23.2 per cent) being even less than in Experiment 5 (24.8 per cent) by reason of the shorter steaming period. The soda cook gave a high yield of pulp (47.7 per cent) and the pulp was of excellent quality. Preserving the full length of the chips on reduction of the wood for this experiment no doubt obviated the tendency toward short, uneven fibre from very small chips.

In Experiment 7 an attempt was made to extract the oleoresin by means of sodium carbonate. An ample excess of carbonate was used (3.26 times the saponification value) and the preliminary treatment was executed in a manner which the experience with caustic soda suggested as most favorable to extraction. It was found that penetration of the wood was slow and that solution of the rosin was far from being complete in the reasonably long period allowed for heating. Furthermore, frothing was more troublesome than with caustic soda and it was difficult to obtain a clear distillate. Distillation of turpentine was slower and the yield was low (41 gals. per cord), due to retention of volatile oil by the unsaponified rosin remaining in the chips. This was apparent from the recovery of an additional 2.9 gals. per cord during the soda cook. A decided advantage was noticed, however, in the decreased attack of the lignocellulose by the weaker alkali, the amount dissolved being only 11.4 per cent. of the actual wood. The chips were finally cooked in a 2.3 per cent caustic soda solution, and kept at 100 pounds pressure for $2\frac{3}{4}$ hours. Disintegration was hardly thorough enough, as the pulp retained the chip form and required long treatment in the beater before the fibres would felt properly. This explains the high yield of 49.7 per cent.

In Experiment 8 the resinous chips were submitted to a single treatment for pulp to provide a standard for the comparison of fibres. A 4.8 per cent solution of NaOH was used, containing an amount of Na_2O equal to 18.5 per cent of the weight of the resinous wood. With the intention of also making this run a quantitative determination of turpentine the pressure was first held at about 30 pounds for 3 hours in order to distil over the turpentine at a moderate temperature. Unfortunately, a slight leak developed in the top of the digester and the recovery of volatile oils amounted to only 32.6 gals. per cord. After most of the turpentine had been removed, the pressure was raised to 100 pounds and cooking was continued for 3 hours more. The yield of pulp was 44.2 per cent and the fibre was long and uniform, although apparently no different from the pulp obtained in certain of the two-stage operations.

TABLE I

Preliminary Alkali Extraction of Resinous Chips

	Experiment Number.						
	1	2	3	4	5	6*	7
Kind of Alkali Used...	NaOH	NaOH	NaOH	NaOH	NaOH	NaOH	Na2CO3
Wt. of Resinous Chips-Grams............	2000	1000	1000	1500	1500	1500	1500
Na2O Used—Multiple of Theoretical Value.	3.2	1.6	2.17	4.34	3.47	3.0	3.26
Volume of Liquor—c.c	7000	6000	5000	7000	7000	7150	7000
Strength of Liquor—% Na2O..........	2.6	0.77	1.25	2.68	2.14	1.82	2.02
Relieving Pressure—Pounds Gage.......	20	30–40	25–30	25	15–20	15–20	30
Time under Pressure—Hours..............	3.5	3	4	3.75	4	3.5	3.5
Crude Turpentine—c.c	113	86	93	139	145	145	128
Crude Turpentine—Gals. per Cord......	27.1	41.3	44.6	44.5	46.4	46.4	41.0
Crude Turpentine—Index of Refraction at 15°C............	..	1.4742	1.4742	1.4738	1.4741	1.4733	1.4742
Crude Turpentine—Specific Gravity at 15°C..............	..	0.8753	0.8854	0.8849	0.8743	0.8770	0.8774
Wt. of Dry, Extracted Chips (Rosin-free)—% of Original Wood .	..	..	44.8	41.2	40.8	41.7	48.1
Wt. of "Humus," Dissolved—% of Actual Wood..............	..	..	17.5	24.1	24.8	23.2	11.4

*Extraction of Smaller Chips.

Discussion of Table I

Table 1 contains most of the important data bearing on the preliminary extractions. The rosin determinations have been reserved for later discussion (see Table 2.)

In computing turpentine yield, a factor was worked out for the transformation of volume in cubic centimeters to gallons per cord. A yield of 1 c.c. from 100 grams of wood is equivalent to a

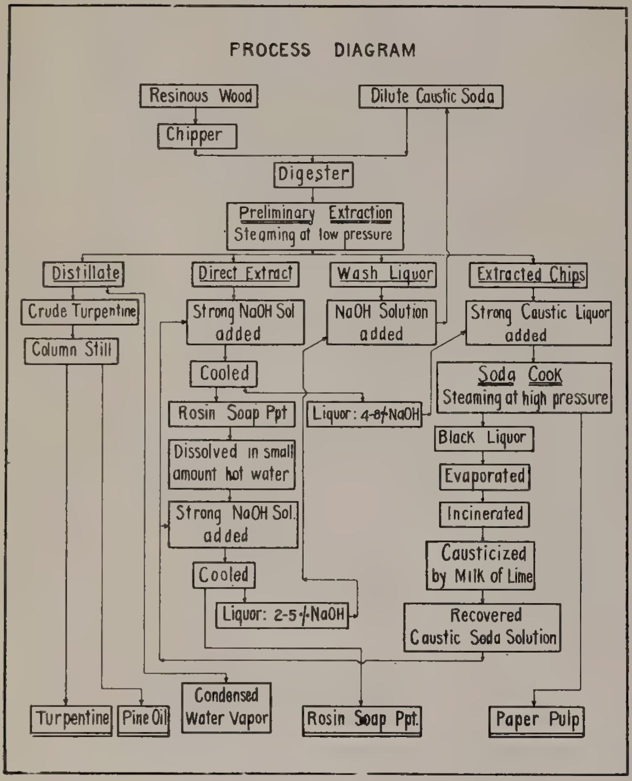
$$\text{production of} \frac{4{,}000}{100 \times 8.335} = 4.8 \text{ gallons from a cord of}$$

4,000 pounds. The wood used probably weighed considerably more than 4,000 pounds per cord, but this figure has been chosen as a conservative estimate for rich pine.

The index of refraction was obtained by the use of a Pulfrich refractometer. The readings were made at room temperatures (17-23°C.) and the index at 15°C. calculated. The positive correction of 0.00047 per degree centigrade was used, in accordance with the recommendation of the government laboratories. (U. S. Dept. Agr., Forest Service, Bul. 105, p. 13.)

Specific gravity was in all cases measured at 15°C., by the use of cooling baths. A 50 c.c. specific gravity bottle was used for the larger fractions, while a 5 c.c. Ostwald pycknometer had to be employed in examining the smaller fractions which furnished the data for Figure 3.

The important variable in the various runs was the ratio of alkali to wood. The unit basis for calculating the amount of NaOH or Na_2CO_3 to be used in the preliminary treatment was the weight of Na_2O theoretically necessary to saponify the rosin in the wood. Although abietic acid has a molecular weight of about 312, American rosin acts as if its "molecular weight" were close to 346 (Lewkowitsch, "Chemical Technology and Analysis of Oils, Fats and Waxes, Vol. 1., p. 499). Of course each sample of rosin has its own saponification number, but for convenience the above figure has been taken as an approximation of the average combining weight of the rosin in the chips. This basis rosin would require 31/346 =8.96 per cent of its weight of Na_2O to produce a neutral sodium resinate. The wood under consideration contained 32.1 per cent of rosin, so that 100 parts of resinous wood required at least 2.88 parts of Na_2O for complete saponification of the rosin therein. The amounts of Na_2O actually used have been expressed as multiples of this unit value. The attempt was to find the least amount of caustic which would completely extract the rosin before neutralization, of alkali by the rosin and humic acids under conditions allowing efficient turpentine distillation and still preventing undue attack of the wood itself. With the preliminary extraction continued for 3.5 4 hours at 15-30 pounds pressure, the lower limit for NaOH was found to lie somewhere between 2.17 (Expt. 3) and 3.0 (Expt. 6) times the theoretical amount of caustic. In the former case extraction was incomplete, due to premature neutralization of the caustic, while in Expt. 6 there was thorough penetration of the wood and an appreciable excess of NaOH was found in the black liquors. Under the conditions employed, the minimum amount of caustic necessary for extraction could be safely placed at about 2.5 times the theoretical value. The excess above that needed for saponification of the rosin was of course neutralized by combining with the decomposition products from the wood itself.



The relieving pressure was varied somewhat, but without appreciable change in the other steaming factors. The aim was to discover the lowest pressure at which distillation of turpentine and penetration of the wood could be carried on without unduly lengthening the time of treatment. To attain least contamination of the rosin extract by the decomposition products of the lignin, it seemed desirable to work towards a low alkali ratio and a low steaming pressure. A pressure of 15-20 pounds was found to be effective in achieving the most favorable results.

The time consumed in extraction varied from 3.5 to 4 hours and must in most cases be considered a maximum, because of the attempt to recover all the turpentine. The greater proportion of the run was spent in distilling the last small portions of oil. An important feature in the design of a digester for practical operation would be the provision for rapid steam distillation, so that the final portions of volatile oil could be carried over as soon as liberated by disintegration of the rosin. This would shorten the time of preliminary treatment and decrease the effect of the alkali on the rosin and the wood. A large dome or distilling head set with closed steam coils might successfully break the froth and allow proper control of distillation from the digester.

There was considerable attack of the lignocellulose, as may be seen from the amounts of humus, etc., dissolved (11.4 24.8 per cent of the actual wood). This decomposition of lignin, seemed to depend as much on the time of contact with the alkali as on the ratio of caustic used. This action does not signify a waste of alkali or an injury to the wood, but rather represents the first stages of the ordinary pulping operation. The dissolving of the humus is objectionable only because of the extra steps of its contamination of the rosin soap and because of the extra steps involved in removing it from the same.

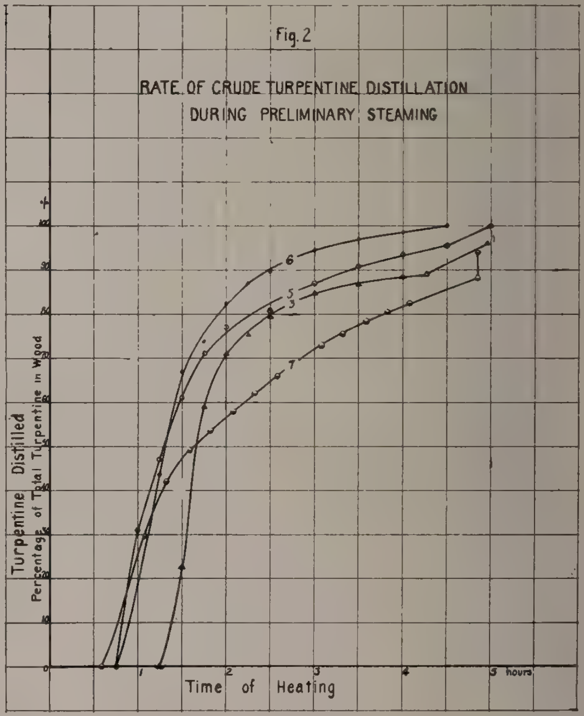


Fig. 2

Rate of Turpentine Distillation

Representative curves showing the rates of turpentine distillation are given in Figure 2. In order to compare the results on a convenient basis the yields from Expts. 5 and 6 have been taken as standard and assumed to be 100 per cent of the volatile oils in the wood. All turpentine fractions in the four experiments considered have been calculated as percentage of this maximum value. The abscissas represent the total time of heating, starting from room temperature. The ordinates show the percentages of the total turpentine in the wood, which were recovered at different stages of the steaming.

The most noticeable feature is that the great bulk of the turpentine was recovered during the first stages of relieving and about as fast as the steam could carry it over. After relieving one hour, approximately 75 per cent. of the turpentine had been recovered. The last 25 per cent was evolved more slowly. With proper appliances for more rapid distillation of steam, it is quite probable that this proportion of the turpentine could be recovered in much less time. The final upward turns of the curves represent the last fractions which were carried over by the rather large quantities of steam drawn off in reducing the pressure to atmosphere. The curve for Expt. 7 shows the retardation when sodium carbonate was used. The extraction of rosin was in this case incomplete. The vertical portion of the curve indicates the turpentine fraction recovered during final cooking for pulp.

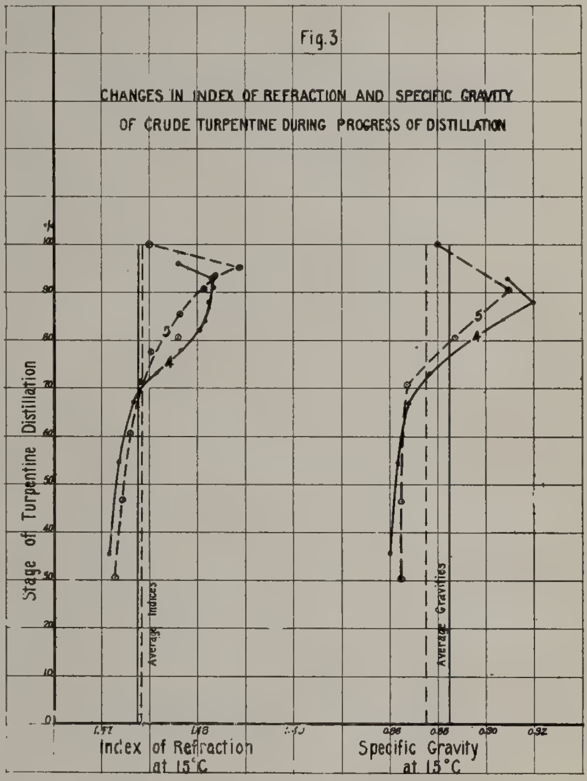
Another outstanding feature is the remarkable similarity of the curves, in spite of the differences in treating the wood. In the three experiments where caustic soda was used it will be seen that the curves almost converge at the two hour mark. This indicates that it makes little difference whether distillation is commenced as soon as pressure is is evidenced or whether relieving is postponed a little.

The gradual flattening of all the curves and the marked retardation in turpentine evolution in Expt. 7, where solution of the rosin was slow and incomplete, indicate pretty clearly that disintegration of the rosin is necessary for efficient turpentine recovery. This is the difficulty experienced in the ordinary steam distillation process, where the fine resinous material must be subjected to the action of steam for 3-10 hours and even then without the recovery of the last traces of oil. In a degree, then, the curves represent the speed of alkali penetration of the wood. Evidently, an important phase of the distillation is to ensure rapid removal of the turpentine from the digester during the last stages of the steaming period, so that the operation can be discontinued as soon as the rosin is dissolved and the last of the oil thereby liberated.

The amounts of steam necessary to carry over the various turpentine fractions are important from a practical view-point. In nearly all cases the first 50 per cent. of the oil was distilled with less than its own volume of condensed water-vapor. The next 25 per cent required from 1 to 4 times its volume of aqueous distillate, the ratios in the most representative experiments (4, 5 and6) being 1.2, 1.3, and 1.0 respectfully. The fraction from 75 to 90 per cent require ratios of from 7-10 under properly regulated conditions. The figures for the final 10 per cent are now significant, because of the large amount of steam removed at the end of the treatment to ensure evolution of the last traces of turpentine. The ratios for this period varied from 40 to 50. It will be apparent that the ratios of condensed water vapor to turpentine are well within the practical limits. In fact, a much more rapid evolution of steam would be justified in order to shorten the steaming period.

The nature of the turpentine curves suggests that it might be found more economical in practice to discontinue the preliminary steaming before the last traces of turpentine were removed. This would mean a saving in steam consumption and a less severe attack of the wood itself.

In conclusion it seems reasonable to assume that a properly conducted alkali extraction will allow recovery of all the volatile oils in the wood in a high state of purity.



Partial Fractionation of Volatile Oils.

Figure 3 will serve to show certain changes in the nature of the volatile oils during the progress of distillation. The fractions were saved separately every fifteen minutes in Experiments 4 and 5 and the refractive index and specific gravity constants of each fraction were determined. The ordinates have been chosen to represent the various stages of turpentine distillation, expressed in percentages of the total turpentine content of the wood. The backward turn at the end of each curve is occasioned by the final fraction obtained while drawing down the pressure. The average constants, obtained by finally combining all the fractions, are shown by the vertical lines.

The curves of index of refraction and specific gravity for a single experiment follow closely parallel to one another. Moreover, the curves are materially the same for the two experiments. It is apparent that the oil became heavier as distillation proceeded and that the last period of steaming was spent in removing the fractions, which approach pine oil in general properties. This shows that distillation of the crude turpentine is not coincident with its liberation from the rosin, for otherwise the distillate would be uniform throughout the run. The heavier constituents are carried over more slowly by the steam and require extended treatment to ensure their recovery. This also points to the advantage of rapid steam evolution during the last stages of the preliminary treatment in order to remove the heavier oils from the solution as quickly as possible.

The change in the nature of the oil during distillation suggests that this direct recovery might be used as a preliminary fractionation of the crude turpentine into "wood turpentine" and "pine oil."

TABLE 2

Distribution of Rosin after Alkali Extraction

[Results expressed in Percentages of Total Rosin in Original Wood—Ether Value =32.1 per cent.]

Fraction.	Form of Rosin.	3	4	5	6*	7°
Dir. Ext.	Dir. Cool'g...Soap Ppt.	48.2	70.7	65.5	59.2	53.3
Dir. Ext.	Dir. Cool'g...Filtrate	18.0	5.9	8.7	20.2	8.4
Dir. Ext.	Strength'n'g to $\frac{7}{8}$% NaOH Soap Ppt.	63.5	75.0	72.0	76.5	59.4
Dir. Ext.	Strength'n'g to $\frac{7}{8}$% NaOH Filtrate	2.7	2.8	2.8	2.8	2.3
Dir. Ext.	Total Rosin as Soap	66.2	77.2	74.5	79.4	61.7
1st Wash Liquor	Sol. Rosin Soap	11.7	10.6	11.2	9.7	10.0
2nd Wash Liquor	Sol. Rosin Soap	2.9	3.4	2.5	2.9	4.4
Washed Chips	Unsaponified Rosin	7.8	0.15	0.9	0.14	8.0
Balance		11.4	8.6	10.9	7.9	15.9

* Extraction of Smaller Chips with NaOH.
° Extraction of Larger Chips with Na2CO3.

Reclaiming of Rosin

Table 2 shows the distribution of the rosin content of the wood after alkali extraction and washing. The analytical results have been expressed as percentages of the total rosin in the original wood as determined by extraction with ether.

As already mentioned the direct extract was aliquoted and treated in two ways. Some portions were allowed to cool directly; others were treated with additional caustic soda to precipitate the soap more completely and leave a supernatant liquor, which would represent a solution available for the final soda cook in industrial practice. Where solution of the rosin was complete, from 75 to 79 per cent was removed in the first draining. Of this amount, from 96 to 97 per cent was recovered in the form of soap precipitate by strengthening the liquor with caustic soda up to 6-8 per cent. The sodium resinate remaining in solution was of course dependent on the solubility of the soap in the strong alkali, and on this account was practically a constant quantity—2.3 to 2.8 per cent of the total. The percentage would be relatively higher in the case of leaner woods, but the actual loss is comparatively small. This unrecovered rosin would be carried through the soda cook and would be of some advantage as fuel in the final incineration involved in the recovery of alkali from the waste pulping liquors.

The figures for direct cooling of the extract are interesting only in showing the necessity of salting out the soda with stronger caustic. The filtrate losses were high and varied inversely as the excess of alkali left in the extract after preliminary steaming. In Expt. 6, for instance, where the caustic was nearly all neutralized, the rosin remaining in solution amounted to 20.2 per cent. of the total.

From 10 to 12 per cent of the rosin was removed in the first washing of the chips. This treatment must therefore be looked upon as an important step in the process. It was found that 80 or 90 per cent of this rosin soap could be recovered by precipitation with caustic. An industrial cycle might involve the salting out of the resinate in this way. An alternative would be the addition of enough caustic soda to the first wash liquor to allow its use directly as the alkali liquor for extraction of the wood in the succeeding cycle. This would permit the precipitation of the inherent resinate in the next "direct extract."

From the direct extract and the first wash liquor it was possible to recover about 85 per cent of the total rosin in the wood in the form of rosin soap precipitate, salted out of solution by means of caustic soda.

Comparatively little rosin was obtained from the second wash liquor and this step would hardly be justified in practice.

The unsaponified rosin, determined by ether extraction of the washed, dried chips, indicates the efficiency of the alkali extraction. In Expt. 3, 7.8 per cent of the rosin was left undissolved by reason of the premature neutralization of the small amount of caustic used. In Expt. 7 the sodium carbonate failed to penetrate the wood in the time allowed for steaming and 8 per cent of the rosin was retainedin the free state by the chips. Experiments 4, 5 and 6 represent practically perfect extractions of rosin.

The "balance" includes 3-5 per cent of soluble resinate retained by the chips after the two washings and small quantities of soapy liquor surging over with the distillate during steaming. Mechanical losses in handling the liquors and in analysis are also involved in this figure. The main discrepancy seems to be due to decomposition occasioned by the alkali in dissolving the more or less complex resinous content of the wood.

TABLE 3

Soda Cooks for Pulp

	Experiment Number. 1	2	3	4	5*	6°	7	8.*i*
Ratio of Liquor to Wood	7.5	14.0	6.7	13.5	8.16	9.6	10.0	5.0
Ratio of Na2O to Wood-%	24	28	27.9	35.0	19.8	16.5	18.1	18.5
Str. of Alk. Liqr.-% Na2O	3.2	2.0	4.17	2.6	2.42	1.72	1.8	3.7
Causticity of Alkali-%	...	...	94.3	94.8	81.0	94.5	96.0	94.5
Time at 100 Pounds Pressure—Hours	2.25	4.0	3.5	3.25	2.75	2.5	2.75	3.0
Turp. Recovered Gals. per Cord	2.0	0	0.3	0	0	0	2.9	32.6
Yield of Pulp on Dry Basis—% of Res. Wd.	...	22.5	22.3	22.8	25.2	25.9	27.0	24.0
Yield of Pulp on Dry Basis—% of Act. Wood	...	41.5	41.0	41.8	46.4	47.7	49.7	44.2

*Black Liquor from Preliminary Extraction used as Cooking Solution
°Soda Cook on Smaller Chips.
*r*Direct Soda Cook of Resinous Chips.

Production of Pulp.

The more pertinent data on the soda cooks have been assembled in Table 3. For the sake of convenience, caustic soda was used in reducing the wood to pulp. In Expt. 5 the solution used for cooking was the black liquor from the preliminary extraction of rosin, which had been strengthened with caustic soda to salt out most of the resinate. The sulphate process would have yielded better fibre, but in these investigations there seemed no necessity of complicating the treatment by the addition of sodium sulphide.

In the first seven experiments, the chips which had been subjected to alkali extraction and washing were used as raw material. In Expt. 8 a single steaming of the wood was employed. The pressure was held at about 30 pounds for 3 hours in order to disintegrate the rosin and to distil the turpentine without decomposition thereof. The pressure was then raised to 100 pounds for final pulping.

The first two ratios—liquor wood and Na$_2$O wood—are based on the dry weight of the extracted chips in Expts. 1-7, and on the weight of the original resinous wood in Expt. 8.

"Causticity" refers to the ratio of the sodium oxide present in the cooking liquor in the form of NaOH over the total amount present both as NaOH and Na_2CO_3.

The pulp was dried at 105°C. and the yield calculated first as percentage of the original resinous wood to show the over-all yield, and second as percentage of actual dry rosin-free wood in the original material, to indicate the true efficiency of the pulping operation.

The turpentine figures refer in the first 7 experiments to the additional recovery during the soda cook, signifying in several cases incomplete disintegration of the oleoresin in the preliminary treatment. In Expt. 8 the turpentine was obtained by a combined extraction and pulping of the wood.

The actual data are in many ways not comparable with those in ordinary soda-mill practice. The "liquor wood" ratio is usually from 4 to 6, when a digester is filled with chips and flooded with liquor. Because of the decreased volume of the wood after preliminary extraction, a larger ratio of cooking solution was necessary to properly fill the experimental digester and prevent exposure of the chips. With lean woods the Na_2O ratio is usually from 17 to 25 per cent and the actual consumption of NaOH about 15 per cent., equivalent to about 15 per cent of Na_2O. By reason of the partial attack of the lignin in the preliminary extraction, a ratio of sodium oxide below 20 per cent was found to be most satisfactory. The above considerations necessitated a low strength of cooking liquor—lower than would be necessary in practice. A concentration of 5-10 per cent NaOH is usually employed in practice.

The pressures used in soda cooking vary from 75 to 150 pounds, the higher values applying particularly to deciduous woods, such as poplar and basswood. In these experiments a pressure of 100 pounds was chosen as a satisfactory figure for pine. The time necessary to reduce the pine to pulp was comparatively short due to partial decomposition during preliminary steaming and also to the more effective action in the small digester.

The outstanding feature of the several experiments was that there was no failure in obtaining strong, long-fibred pulp of good quality. The preliminary extraction did not detract to any noticeable degree from the quality of the final fibre. The soundness of the raw material and the use of large chips was of course largely responsible for the favorable nature of the pulp. In Expts. 2, 3, 4 and 8 the pulp was quite thoroughly disintegrated by the stirring device and the fibre was "soft." It will be seen that low yield is coincident with soft fibre. In Expt. 5 the pulp retained the chip form but yielded to disintegration on handling. Expt. 6 gave a strong pulp from the smaller chips. Expt. 7 represents a "raw" cook, in which the pulp was blown in the form of firm chips. Careful reduction in the beater gave a fibre of dark brown color and considerable strength, although the insufficient cooking had left the fibre somewhat "woody."

The over-all yield of approximately 25 per cent of pulp illustrates the practical drawback in treating this resinous material directly for pulp alone, not to mention the high consumption of alkali which would be involved in dissolving the rosin and the mechanical difficulties in cooking and washing. The true pulp yields are well within the range of ordinary practice. The figures between 45 and 50 per cent must be considered as most typical, inasmuch as the raw material is especially adapted to the production of somewhat raw, strong fibre for making high-grade wrapping papers, etc.

Nature of Products

Turpentine: (1) As regards the character of the crude turpentine obtained during alkali extraction, it is apparent that the product represents the volatile oils of the wood practically unchanged by distillation from dilute alkali at low steam pressures. In the refining of the crude turps. from the 'Steam Distillation" process, it is customary to redistil after the addition of dilute alkali. It may be said, then, that the volatile oils from the alkali extraction process have already undergone the first step in refining.

The direct product was in every case clear and only faintly yellowish in color. The oil was without the objectionable odor of "Destructive Distillation" turpentine. The odor was pleasant and of an "essential oil" character, rather than of pure turpentine. This may be ascribed to the pine oil content.

It was not considered necessary to give particular attention to the refining of the crude turpentine. The methods have been carefully worked out and there are no special difficulties involved. (see U. S. Dept. Agric., Forest Service Bull. 105 and Bur. Chem. Bull. 159). Separation into "wood turpentine" and "pine oil" would be accomplished by redistilling with steam, preferably in a column still. The final yield of turpentine, boiling between 155 and 185°C., can be placed at 70-85 per cent, the balance being pine oil boiling above 185°. The turpentine fraction would undoubtedly contain a small quantity of dipentene as impurity, although this amount should be smaller than by direct steam distillation of the wood, where the higher temperatures cause partial decomposition of the oils into depentene. Pine oil is almost as valuable as turpentine, so that there would be very little waste in purifying the original crude oil.

Rosin Soap. (2) The proposed scheme provides for the recovery of rosin from the direct extract and first wash liquor by salting out the rosin soap with caustic soda. It has been shown that 75-85 per cent of the rosin can be obtained in this way from rich wood. The soap precipitates were soft, and more or less contaminated with material derived from the wood itself. Purification from the humus was accomplished by reprecipitations with caustic soda. The soft soap was not successfully filtered and pressed, and for this reason retained appreciable amounts of alkali liquor.

It would seem logical to use the soap as such, without acidifying to liberate free rosin. Rosin soap has marked detergent properties and is a constituent of many commercial soaps. The soap maker, however, usually incorporates the rosin by neutralizing the excess of free alkali with the free rosin acids, after saponification of the fats. Rosin soap is also used in many lubricating greases.

One of the most reasonable applications is to be found in a paper mill itself. All ordinary papers are sized with rosin, added to the beaters in the form of soap solution and finally precipitated by alum. By dissolving the soap precipitates obtained in the process under discussion, and heating with a certain amount of free rosin, it should not be difficult to provide an emulsion of the composition demanded by the paper maker.

There are possible drawbacks in a scheme of this kind. The presence of oils in size sometimes results in spotting of the finished paper. However, by careful distillation of the crude turpentine during extraction of the wood, it is doubtful if more than a trace of oily matter would find its way into the finished size. The humus carried down by the colloidal sodium resinate detracts somewhat from the white color of the rosin soap and gives a brownish color to the solutions. It is a question whether the small proportion of humus in the original rosin soap would appreciably affect the value of the directly prepared size, except for use on white papers. Humic salts have even been suggested as possible sizing agents in themselves. (E. Rinman, Svensk Keniisk Tidskrift, see J. Soc. Chem. Ind., Feb. 29, 1912, p. 183). At any rate, reprecipitation with caustic soda offers a convenient method of purification.

Paper Pulp: (3) In addition to the products mentioned above, it has been shown that the normal yield of high-grade pulp can be obtained from resinous pine by the methods described. The whole process, in fact, has been designed with this end in view. The two-stage treatment adapts itself to the employment of any of the so-called "alkaline" processes for final production of fibre. It would not be desirable to use "sulphate" liquor for extraction of the rosin, but in a sulphate mill, where the two-stage treatment of rich wood was carried on in conjunction with ordinary pulping operations on lean wood, there should be no difficulty in providing for the preliminar pextraction of the rich wood with caustic soda alone. As a source of alkali for cooking, the strengthened black liquor from the "direct extract" was found to be satisfactory.

The pulp obtained from long-leaf pine is characterized by unusual length of fibre, the length being 4-6 millimeters, or about twice that of spruce fibre. This quality, coupled with the favorable strength and flexibility of the fibre, imparts to the finished paper unusual toughness and resistance to folding and bursting.

The soda cooks gave brown pulp, which did not lend itself readily to bleaching. The consumption of bleach was high and the final color was distinctly yellowish. As has already been mentioned, the sulphate process is preferable where bleached pulp is desired.

The pulp from long-leaf pine is well suited for making high-grade wrapping paper, board stock, etc. With further study of the methods for cooking, beating and bleaching, it is expected that the uses of the pulp will be greatly extended.

Significance of Results.

The data obtained in these investigations are not claimed to be exactly representative of those which would hold in industrial practice. The experiments were carried out on too small a scale to justify such a conclusion. Furthermore, there was a limitation in the kinds of southern pine waste examined. The box-face slab material was a high-grade waste, the wood being clean and sound and containing proportions of rosin and turpentine close to the upper limit for long-leaf pine. However, an important consideration in this connection is that the rich wood presented almost the maximum difficulties as far as complete extraction of rosin and turpentine was concerned.

The prime deduction from the experimental results is the feasibility of a two-stage treatment for the chemical utilization of waste southern pine. It was possible to obtain a high recovery of valuable products from the primary constituents of the wood. The crude products were isolated in a favorable state of purity and required little subsequent refining. The process was characterized by simplicity in manipulation and in separation of end products. Moreover, the materials used in the reduction, as well as the ultimate products themselves, were few in number and simple in nature.

There was no waste of alkali at any point. The portion withdrawn from the cycle in the form of precipitated sodium resinate served to enhance the value of the rosin fraction. Incineration of the waste pulping liquor provides for the recovery of the balance of the alkali, within the practical limits of mechanical efficiency.

As mentioned before, practical application of this treatment of the more resinous materials could be carried on most conveniently as a supplement to ordinary pulp-mill operation on lean wood. Only slight modifications in certain of the existing digester units would be necessary to take care of the richer grades of pine. The supply of fat wood could be obtained by sorting the raw material received at the pulp mill or by procuring lightwood, etc. from independent sources.

There is also a possibility that the first stage of the process, namely that of extraction with caustic soda or sodium carbonate, could be employed in treating those grades of resinous waste which would not lend themselves to final pulping. Charred or unsound wood might be steamed with dilute alkali for the recovery of rosin and turpentine, without provision for treatment of the extracted chips. The economic merits of such a scheme could only be decided by actual trial.

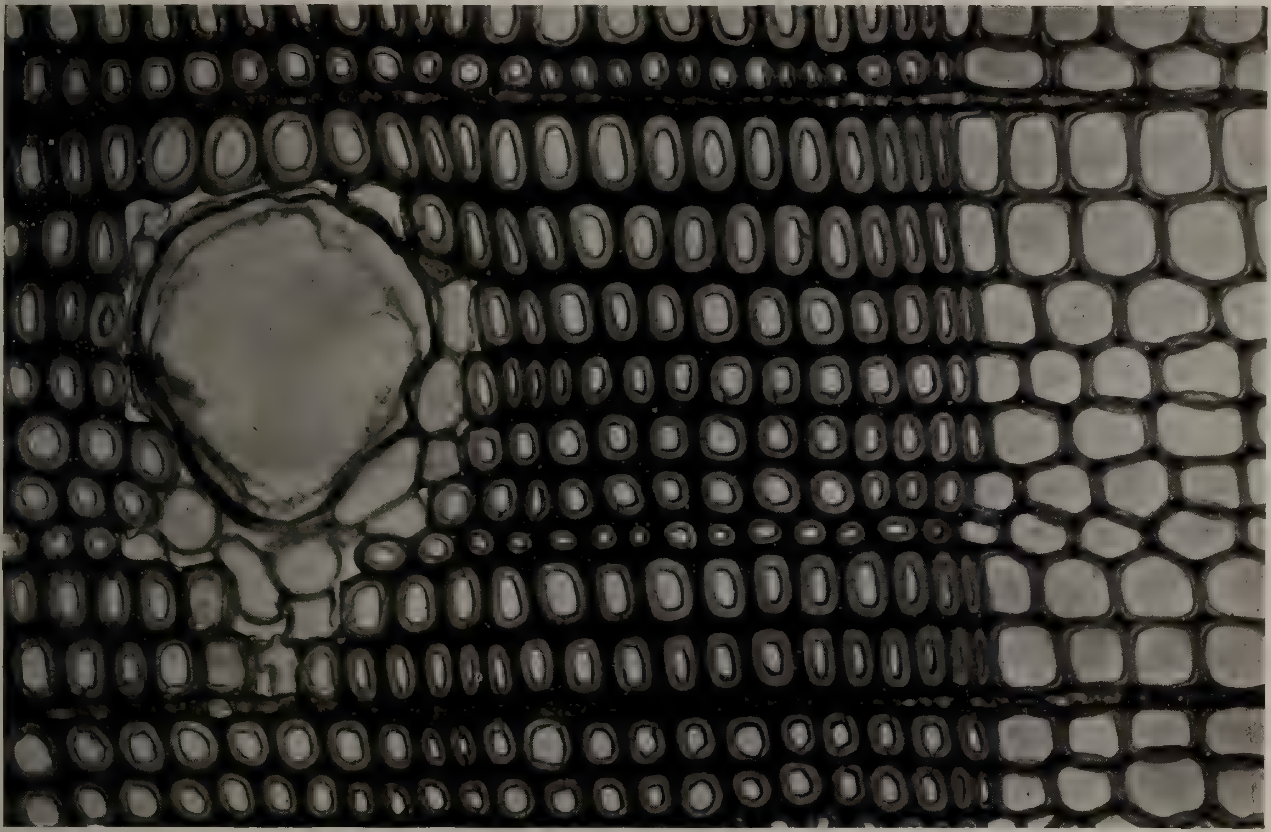
NEW BRUNSWICK'S LUMBER OUTLOOK.

The importance ot the lumber industry to St. John and the Province of New Brunswick generally is shown by the extent of the exports for the year 1913. While there has been some falling off in the quantity of lumber cut during the last few years, it has been due to market conditions instead of to any falling off in the available sources of supply Spruce is still king, but some pine is cut, as well as hemlock and cedar, and a considerable quantity of hardwood. The new Transcontinental Railay, and the International Railway, which runs across the northern part of the province, have opened up very valuable sections of hardwood timber, including birch, maple and beech. The total exports of lumber from New Brunswick to trans-Atlantic ports last year was over 270,000,000 feet, of which over 86,500,000 feet was shipped from the port of St. John. There was also large shipments to the United States, some by water and some by rail The shipments from St. John to the American market for the year were valued at $1,527,000. The quantity of pulp shipped from St. John to that market for the year was valued at over $328,000, and the pulp-wood at over $83,000. There is a growing trade in New Brunswick lumber with the Montreal district and Eastern Ontario, and during last year, when other markets are dull, this was an important branch of the trade in the northern section of the province.

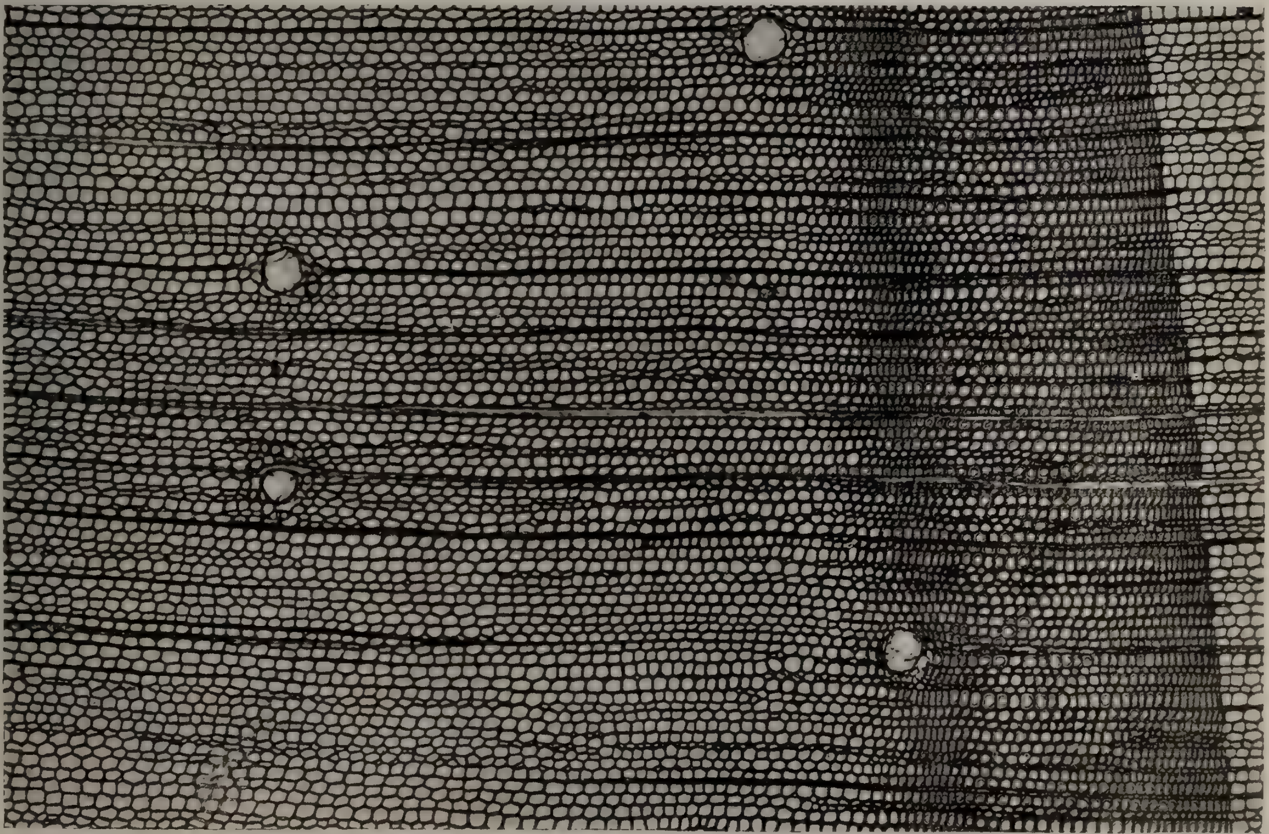
Micro. Photographs of Paper Making Woods---PINE

Made under the direction of H. D. TIEMANS, U.S. Forest Products Laboratory, Madison, Wis.

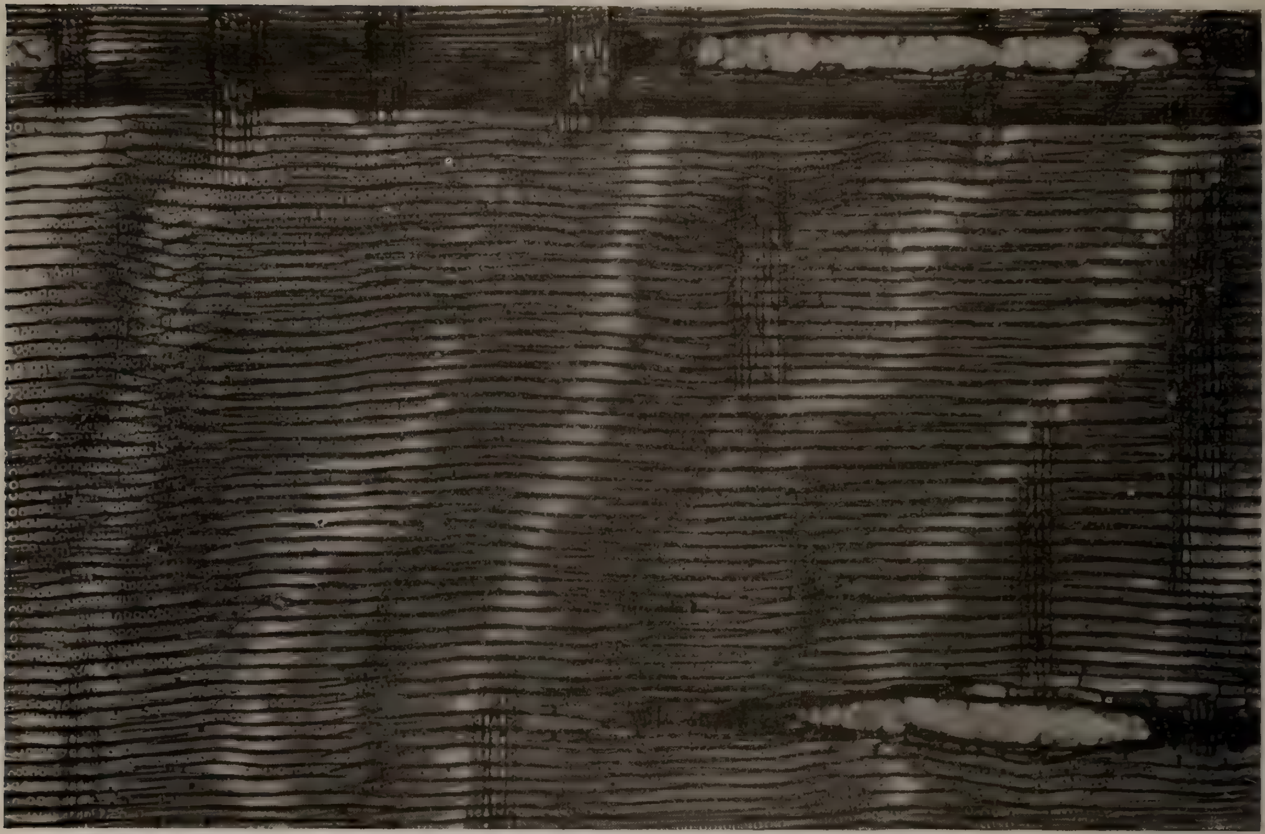
(Continued from last issue)



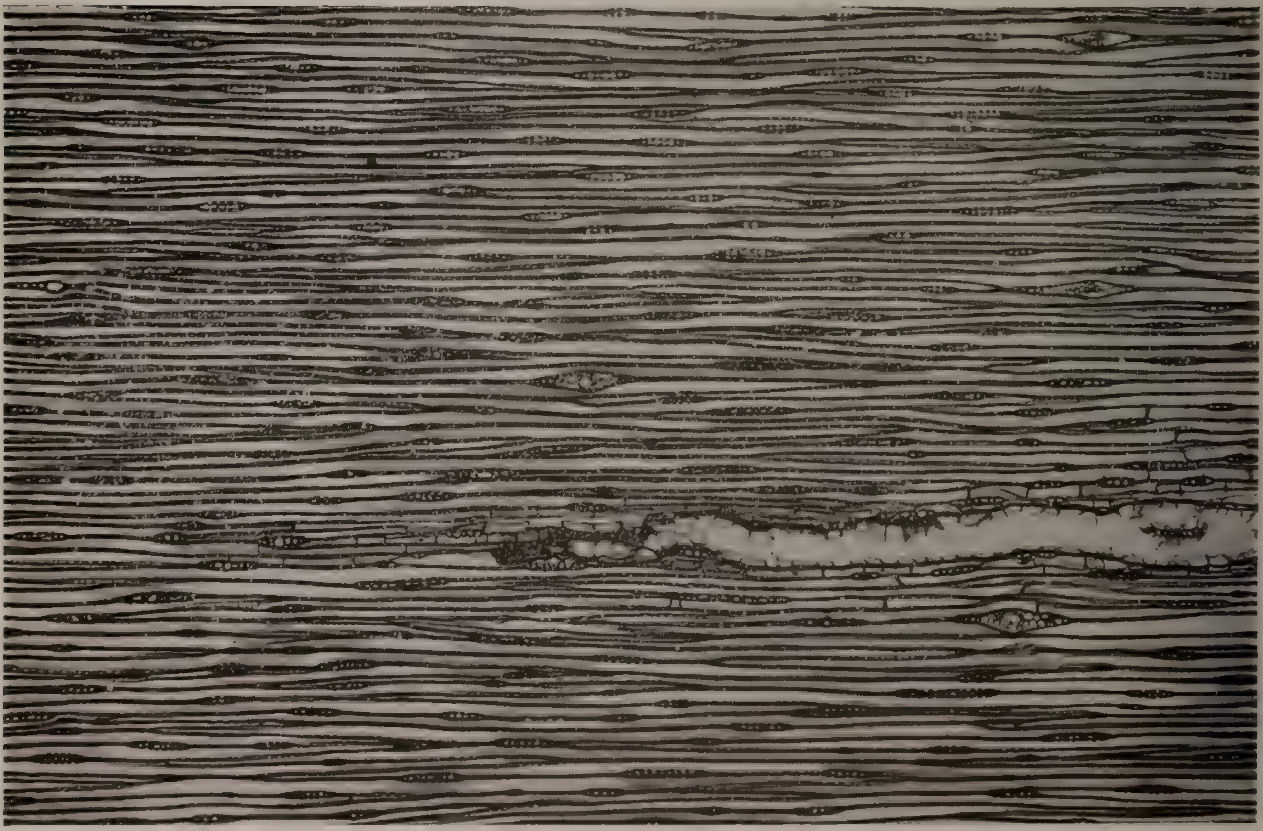
PINUS ECLUNATA—Shortleaf Pine, Transverse x 250



PINUS RESINOSA,—Norway Pine Transverse x 50



PINUS RESINOSA—Norway Pine, Radial x 50



PINUS RESINOSA—Norway Pine, Tangential x 50.

Conservation Commission Recommendations.

Ottawa, Jan. 25.—A number of important recommendations affecting the forestry interests of Canada were passed at the fifth annual meeting of the Conservation Commission, which took place in the capital last week on the 20th and 21st and was the most important event of the month in pulp and paper circles. Forestry topics as usual were extensively discussed and the necessity of taking the forestry service out of politics; of preventing the settlement of lands suited rather for timber growing than agriculture; of more efficient fire protection and larger appropriations for the work generally as well as increases in the reserves, was emphasised by means of reports and recommendations.

The report, possibly, of greatest interest to the pulp and paper trade, was that presented by Dr. B. E. Fernow—dean of the faculty of forestry of Toronto University and the expert whose report on pulpwood and agricultural conditions in the great Clay Belt of Northern Ontario at last year's meeting of the Commission caused so much comment—on conditions in the Trent Valley watershed in Ontario. The report indicated that serious consequences had followed the agricultural settlement of this district, which was chiefly non-agricultural in nature. The soil having quickly become impoverished from cultivation, the people who remained on the poorer lands were existing under undesirable economic conditions. The report indicated that only 15,000 people inhabited the 2,100 square miles of the watershed and that scarcely 10 per cent of the region had been cleared for farm purposes. Run down and abandoned farms were to be found in great numbers and were being sold for taxes at 6 cents per acre. Practically all the pine had been removed, the whole area having been burned over once, and 150,000 acres being practically a desert. It has been found, however, that enough poplar-birch remains to warrant the adoption of a policy of conservation and Dominion, provincial or municipal ownership has been suggested as well as the re-possessing by the province of the cut-over lands. the imposing of restrictions on limit holders, tending to protect the forest growth; the appointment of a forester and the perfecting of a fire-protection organization. The destructon of the forest, it was emphasized, was having a very detrimental effect on the water supply of the Trent Canal.

That Canada has probably not more than one-fifth to one-fourth as much saw timber as the United States was a statement contained in a report by Mr. Clyde Leavitt, chief forester of the Commission, in which he pointed out that Canadians had been accustomed to read about the depletion of the forests of the great republic to the South with a feeling of smug satisfaction that our own forests were quite inexhaustible. Of recent years, however, said Mr. Leavitt, there had been a disillusionment and it was now fairly well known that our forest resources had been greatly over- estimated, and that instead of being able to supply the United States after her timber will have been exhausted, Canada had, as a matter of fact, not more than one-fifth to one-fourth as much saw-timber as the United States.The Commission of Conservation was resolutely attacking the problem of a careful stocktaking of forest resources in Canada where the ground to be covered was enormous. Nova Scotia had already been surveyed. In British Columbia information was being collected relative to the territory south of the Railway Belt through co-operative arrangements with the Provincial Forest Branch and the Canadian Pacific Railway. In Saskatchewan the district west of Prince Albert was being surveyed in co-operation with the Dominion Forestry Branch. Mr. Leavitt recommended that province having control of its natural resources begin an investigation as to the amount of standing timber, forest reproduction and rate of growth.

The Committee on Forests presented a report on forest fire protection which showed that conditions were rapidly improving. The railway companies during 1913 had shown a more sympathetic attitude toward this work. As regards provincially chartered railways, however, new legislation was needed in Nova Scotia, New Brunswick and Alberta and as regards the latter it might be said that the system of fire-protection, neither on the National Transcontinental nor the Intercolconial was as intensive as on privately owned railway lines subject to the Railway Commission

Hon. Clifford Sifton, chairman of the Commission, in his opening address, emphasized the necessity of taking the forestry service out of the realm of politics as political appointees did not make efficient rangers. The following recommendations were then passed:

That the matter of fire protection along Government railways be further taken up with the Dominion Government and that, if possible, such railways be made subject to the fire regulations prescribed by the Board of Railway Commissioners for lines subject to its jurisdiction.

That representations be made to the Governments of Nova Scotia, New Brunswick, Ontario and Alberta, urging that both legislative and administrative provision be made for requiring provincially chartered railways to take adequate steps to safeguard the adjacent country from fires due to railway causes.

The execution of forestry projects already under way and recommended, including the investigation of forest resources and forest conditions in British Columbia and Saskatchewan, would require an addition to the existing appropriation of not less than $10,000, assuming that, in addition, the same amount can be set aside for forestry work, from the regular appropriation as has been made available during the current year.

That favorable action be urged upon the Dominion Government relative to the proposed addition to the forest reserves of 20,980 square miles of land.

That the results of the investigation be forwarded to the Government of Ontario and the Government of the Dominion.

That the attention of the Dominion and Provincial Governments be again drawn to the vital necessity of withholding from settlement all lands which cannot be properly classed as agricultural, and of setting such lands apart for the permanent production of timber supplies. The importance should be especially accentuated of reserving and protecting from fire the vast areas of young forest growth in order that they may reach merchantable size and form a future source of local revenue and industry.

That the Dominion Government be strongly urged to place the field force of the Forestry Branch under Civil Service regulations.

That representations be made to the Dominion Government looking toward the adoption of some plan whereby adequate provision may be made for the enforcement of the technical provisions affecting lumbering operations on the licensed timber berths.

Lumber, pulp and paper and their prices were considered by the Commission on the Cost of Living—recently created by the Dominion Government—last week. Mr. R. H. Campbell, Director of Forestry of the Interior Department, appeared as a witness before the Commission and gave evidence as to the growth and manufacture, sale, importation and exportation of timber and its products. Particular attention was paid to the question of waste in production and manufacture and something was said, it is understood, as to the probable effect of the new Underwood tariff.

That pulpwood to about twenty times the value of that exported from the Ottawa Valley to the United States in 1912 was shipped across in 1913 was indicated by figures compiled by Hon. J. G. Foster, United States Consul in Ottawa, for his Government. The total value of the commodity exported in 1913 was $77,378,27 as compared with $3,141,00 in the previous year. The total export of all timber, however, was slightly less.

These figures are for the calendar year of 1913. Figures covering the export and import to the United States of pulp and paper from all Canada during the fiscal year of 1913 were recently issued by the Trade and Commerce Department and show a decided increase both in imports and exports. The total amount of wood pulp from the United States in 1913, according to these figures, was $191,345 as compared with $49,991 in 1912, The total imports of paper were $5,754,156 as compared with $4,221,220 in 1912. The export to the United States of wood blocks for pulp was $6,806,945 in 1913 as compared with $5,697,901 in 1912, The exports of paper showed a remarkable increase, the figures being $4,390,144 in 1913 and $2,086,394 in 1912, Of the total export of paper, printing paper was the largest item, amounting to $4242,298 in 1913 as compared with $1,989,863 in 1912. Of paper imports, manufactures of paper, N.O.P., amounted to $1,787,319 compared with $1,284,467 the previous year and wrapping paper, $1,368,366 compared with $916,445 in 1912.

The contract has been awarded for the construction of the new home of the Methodist Book & Publishing House which will be erected at the corner of Queen West and John Streets, Toronto. The ultimate intention is to erect a ten storey building but to begin with a five storey structure will be put up. The edifice will have a frontage of 133 feet along Queen Street, 220 feet along John and 190 feet along Richmond Street. When fully completed the building and site will cost in the neighborhood of a million dollars, and will be one of the finest publishing houses on the American continent. The contractors are John H. Parker, Canadian, Limited, of New York.

Toronto News.

(Special to Pulp & Paper Magazine.)

The Gardner Basket Company, Limited, with head offices in St. Catharines, Ontairo, and a share capital of $45,000, have been granted a charter. The company are empowered to manufacture boxes and baskets and other products of wood. The incorporators are Robert Thompson and Charles Edwin Secord, of Grantham; Arthur Onslow, of Niagara; John H. Brodrick, of Louth; and William A. Gardner, of St. Catharines.

A charter has been granted to the Aird Island Logging and Trading Company, Limited, with head offices at Spanish Mills, Algoma, and a share capital of ten thousand dollars. The company are empowered to purchase, acquire and hold timber lands, limber licenses and rights to cut timber and to deal in logs and wood products of every description as well as to erect and operate saw mills.

The annual convention of the Beaver Companies was recently held in Thorold, Ontario. Over seventy representatives of the company came by special train and were warmly welcomed by E. R. Lowe, the Thorold manager, and C. A. Moyle, resident engineer, and conducted over the plant in which the machinery is now being installed. Afterwards all were entertained at lunch in the dining room of the mill. The visitors were later taken through the new plant, of the Montrose Paper Co. under the direction of T. A. Weldon. It is expected that the works of the Beaver Board Co., in Thorold will be in operation about the first of April. The wood fibre machine for the making of beaver board from pure wood fibre is the longest of its kind in the world and has sixty dryers each of six tons which means that the rolls of the machine will represent a weight of 360 tons. The machine, which is being erected on the second storey of the main building, was an object of great interest to the party. The immense dryer rolls are lifted in position with a six and a half ton crane. President W. F. MacGlashan, General Production Manager F. S. Rodgers, and General Sales Manager J. F. Haggerty accompanied the delegation.

The death occured in Weston, Ont., on January 24th, of James R. Barber, who passed away as a result of a seizure of apoplexy, in the sixty-eighth year of his age. He was a brother of John R. Barber, the widely-known Canadian paper manufacturer, and a son of the late James Barber, of William Barber & Bros., who built the Georgetown Paper Mills and later the Canada Coating Mills at Georgetown. The deceased, with J. F. Ellis, of Toronto, was the founder of the Barber-Ellis Co. who have warehouses in Toronto, Winnipeg and Vancouver, and a large envelope factory at Brantford, Ontario. This company was formed in 1876, but James Barber retired a few years later and had since been living retired at the residence of his father-in-law, N. M. Livingstone, in Weston. The father of the subject of this reference was one of the first papermakers in Canada, having practical experience in the old paper mill at Crooks' Hollow, Ontario, and in the middle fifties went to Georgetown where the brothers took over the mill that had been established by David Forbes, the firm being known as William Barber & Bros., which continued in business until a couple of years ago when they disposed of all their interests in Georgetown to the Barber Paper & Coating Mills Co., Limited. The late James Barber, who has just passed away, was held in very high regard by the trade and leaves a widow, three sisters and one brother, John R. Barber, of Georgetown.

The staff of Spanish River Pulp & Paper Co., are now installed in their new offices in the Tyrell building, 95-97 King St. E., Toronto. M. E. Stavert, President, and T. H. Watson, Managing Director, were at Sault Ste. Marie last week attending the monthly meeting of the Board of Directors.

During the past few days many representatives of labor and capital have waited upon the members of the Ontario cabinet with objections against the proposed Workmen's Compensation. P. W. Ellis, of Toronto, on behalf of the Canadian Manufacturers' Association, presented a long list of objections to the proposed bill, some twenty in number, saying that the scale of compensation (fifty-five per cent. of a man's wages) was altogether too high and out of proportion to what is allowed in all other countries where similar leglislation is in force. It was contended by the manufacturers that pensions for permanent disability were absurd and that a man who lost his finger would, under the act, get a life pension. Compensation, it was urged, should not be paid to workmen who are injured by wilful and intentional acts of fellow workmen. The labor men, on the other hand, agree with the principles of the draft bill as recommended by Sir William Meridith, the Commissioner, who was appointed by the Ontario Government to make full inquiries and investigation. It does not go as far as the labor bodies desire but they are willing to accept it as a compromise. If the scale of compensation remains as suggested they object to giving up the rights of recovery at common law. They also contend that there should be no maximum compensation fixed and a man should be fully compensated for any injury that he receives in the course of his employment. It is possible, before the bill passes the Legislature, that there will be compromises on both sides. The measure is arousing much interest among the pulp and paper manufacturers as well as among the lumbermen of the province of Ontario.

The construction of the Welland Ship Canal, which will mean much to the pulp and paper of St. Catharines, Merritton, Thorold and other towns was endorsed by the Executive of the Great Waterways, Union of Western Ontario, at a meeting held last week in Berlin, when a resolution was passed expressing appreciation of the federal government in undertaking so promptly and energetically the construction of the canal as a link in a large ocean to the Great Lakes waterways and urging that the same energetic policy be adopted towards the speedy development and completion of the entire great national waterway. In the matter of the Georgian Bay canal objection was taken to its construction and a resolution was passed urging that Western Ontario and the Pacific provinces receive full representation on the proposed Royal Commission to investigate the commercial facilities of the canal and such investigation be made to cover the entire route from Georgian Bay to Montreal.

It would appear as if Manitoba is coming to the front in a pulp and paper sense. Recently a report on the waterway power potentialities of the province was completed by the water power branch of the Interior Department. The Central Pulp and Paper Co., Limited, has just been granted a provincial charter with a share capital of $200,000, divided into 20,000 shares of ten dollars each and head office in Winnipeg. The concern is empowered to manufacture and deal in paper and pulp of all kinds and the incorporators are J. S. Hughes, R. P. Fournier, George W. Rawlings, K. C. Bradley and A. Gofton, all of Winnipeg. The Celtic Flax Co., Limited has also been granted a charter with a share capital of $350,000 to manufacture and deal in flax and to carry on business as importers of all kinds of paper. The head office is in Beausejour. Among the incorporators are Jas. C. Scott, Winnipeg; Jas. L. Turner, Ed. A. Dugard, John Watson, Joseph Shaw, jr; Jas. D. Crawford and others of Beausejour.

Alex. Annandale, late assistant to F.J.Campbell, General Manager of the Canada Paper Co., Windsor Mills, Que., has joined the Staff of Price Bros., Jonquiere, Que., where he will act in the position of mechanical advisor. Mr. Annandale has had an extended and thorough experience in the paper mills of Scotland, England, Italy, Canada, and other countries, and has many friends among the trade.

J. F. Ellis, of the Barber-Ellis Co., Toronto, has returned from an extended trip to Winnipeg, Saskatoon, Regina, Medicine Hat, Edmonton, Calgary, Moose Jaw and other points. He was accompanied to several points by Wallace Murphy, manager of the Winnipeg warehouse of the firm and reports that business conditions in the west are rapidly improving and there need be no fear about the future. Lorne Graham, who with his brother, Garfield Graham, is joint manager of the Vancouver warehouse of the Barber-Ellis Co. and has been spending a few days in Toronto and points east, has returned home.

At the annual meeting of the Barber-Ellis Co., Toronto, held recently, satisfactary reports were presented for the past year showing a gratifying gain in business. The company's factory in Brantford turned out over 320,000,000 envelopes during 1913, while a very large business was done in the various lines of papeteries, fancy and plain, which the company produce. The old officers were reelected: President, John R. Barber; Vice-President, and Treasurer, J. F. Ellis; Secretary, H. Holt; Directors, F. M. Ellis and C. G. Ellis, Brantford. As announced recently the capital stock of the company has been increased from $125,000 to $500,000.

The interests of the Ontario Paper Co. have organized the Ontario Transportation and Pulp Co., to build and operate boats, etc., and to do a general pulpwood business. They will supply the paper mill at Thorold with pulpwood.

The beater room floor of the Toronto Paper Co., collapsed last week. The damage is now repaired and the beaters turning out full capacity.

Mr. Wallace W. Ruthven, manager of the Empire Paper Box Company of Montreal, died suddenly in the Royal Victoria Hospital. He had been taken to the hospital as an emergency case, having collapsed and become unconscious while driving on the mountain road with his daughter, Mrs. Malcolm D. Barclay. He did not recover consciousness after his sudden turn for the worse.

By the first of April, or a little more than two months from now, the pulp mills of the Wayagamack Pulp and Paper Co., will be turning out 125 tons a day of sulphite pulp. This is considerable of a jump from its initial output some months ago of only fifty tons of pulp a day.

The third unit has been installed in the paper mills. The latter are now turning out sixty tons of fine "Kraft" paper a day. This is an increase of ten tons over the mills' output a few months ago. The total installation consists of the first installation of two 25-ton units; and a third unit for the manufacture of the finer grades, recently placed in operation.

Harry F. Donahue, who came to Montreal last March to become sales manager for the Howard Smith Paper Mills, Ltd., of this city, has resigned his connection there and returned to the States. Mr. Donahue prior to coming to Montreal was for seven years a member of the sales force of Riegel & Co., Inc., Philadelphia, where he was looked upon as one of the ablest and most popular salesmen in the fine paper line.

The lumbering conditions in the Province of New Brunswick are excellent at the present time, according to Mr. Jones, of the Partington Co. Their cut will be smaller, however, owing to the fact that there was a two years' supply on hand last year. The cut this year will be less than half the usual amount. The plant consumes about 18,000,000 feet of pulp wood in the manufacture of its product each year.

A new spur track from the Canadian Pacific Railway [to the mill has just been completed and is about a quarter of a mile long. Heretofore the company has used automobiles for transporting the pulp over this distance to the cars, but now that will be done away with. There has also been a new storehouse erected, which is 150 feet ling and 35 feet wide. A conveyor connects the mill with the loading platforms at the storehouse and the pulp is delivered from the mill right to the car doors.

INCREASE IN RATE ON PULPWOOD HAS BEEN SANCTIONED.

The Railway Commission has issued judgment approving of the proposed increase of one-half cent in the various classes of local rates for pulpwood on the Temiscouata Railway in Quebec. The Intercolonial Railway is also affected by the judgment, as on the movement of pulpwood over the Temiscouata it has hitherto included in its tariffs rates from Temiscouata Railway stations. The increases are authorized, but in order not to interfere with existing contracts, will not become effective until August 15th. They amount to 2 cent on each of the tariffs for four groups, as follows: St. Modeste to Whitworth, 17 1-2 mile siding to Vauhan; 35 mile siding to Hayes; and Notre Dame Du Lac to Connors. The matter was brought up as a result of the protest of the Eastern Townships Lumber Company, Limited, against these increases.

A CLOSE TO NATURE CALENDAR.

From the Capital Wire Cloth and Manufacturing Co., Ltd., of Ottawa, Canada, comes a calendar for the month of January, 1914, which is the first one of a series of twelve close-to-nature pictures. The company intends sending to its friends and patrons one of these interesting picture calendars each month for the year of 1914.

Judging from the one just received which is entitled "In the Northland," and which is reproduced from the original painting by R. H. Collins, the monthly arrival of these calendars will be eagerly looked forward to.

ANNUAL MEETING, AMERICAN PULP & PAPER ASSOCIATION.

(Special to Pulp & Paper Magazine.)

New York, Jan. 25th, 1914.

The American Paper & Pulp Association, 50 Church Street, has just issued notices of its thirty-seventh annual convention and banquet which will cover a period of two days, beginning on the morning of February 18th and lasting through the evening of the nineteenth, when the annual banquet will be held. The convention and banquet as usual will take place at the Waldorf-Astoria, 5th Ave. and 34th Street this city, where also the various divisions will meet. February 18th will be devoted to meetings of the different divisions of the association and any changes or suggestions as to trade customs, etc., may be adopted by each division and ratified by the general meeting, to be held on the following day. It is the earnest desire of the Executive Council that there be full attendance on both days, so matters of vital interest and importance to the trade may be the more thoroughly discussed and acted upon.

The Banquet Committee has arranged for their affair to be held at 7 o'clock Thursday evening, February 19th, and they have decided to limit the number of tickets to 500, thus leaving the attendance limited to the members and their guests. Attached to each notice of the entire affair is an application blank for seats at the banquet. The committee on banquet arrangements is anxious to get all applications with the remittance of $7.50 instead of $10.00 as in previous years for each person, at an early date, in order to enable them to make proper seating arrangements and avoid duplication of invitations.

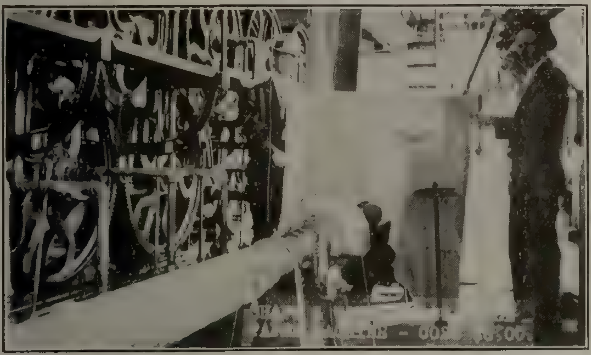
The Ticket Committee will make final seating arrangements on Monday, February 15th, and it is imperative that all applications be in the office of the Association, 50 Church Streeet, on or before that day. It is the desire of the committee to give each applicant the number of tickets he desires, but it may be necessary to curtail the number, in which case (and the same rule will be applied to each applicant), any money received for tickets not issued will be returned to the sender. It is the particular desire of John S. Riegel, chairman of the Banquet Committee, that all applications be in the hands of the Banquet Committee, on arrangements of which Robert D. Carter, president of the York Haven Paper Company, is chairman.

WOOD PULP WORKERS IDLE IN NORWAY.

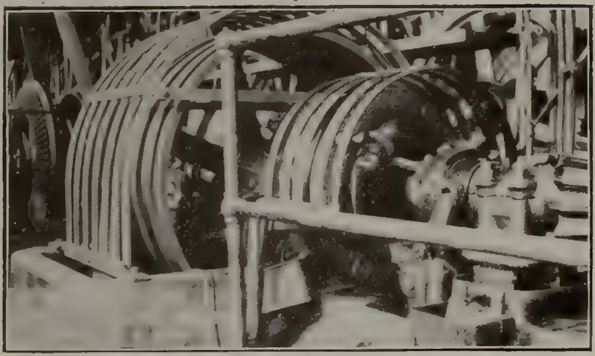
The Norwegian Employers' Association has declared a lockout against the organized laborers of Northern Norway, to take effect February 7th, unless existing troubles are settled within a week. All the wood pulp, cellulose, paper and engineering workmen are idle because of three small strikes, one in a mill near Trondhjem, another in an engineering plant in Christiania and still another among the cabinet workers of Aalesund. These conflicts have lasted a long time, and according to the employers resulted from the breaking of a contract.

Prior to the introduction of syndicalism in Norway two years ago contracts were always kept, but of late contracts have been broken in several instances

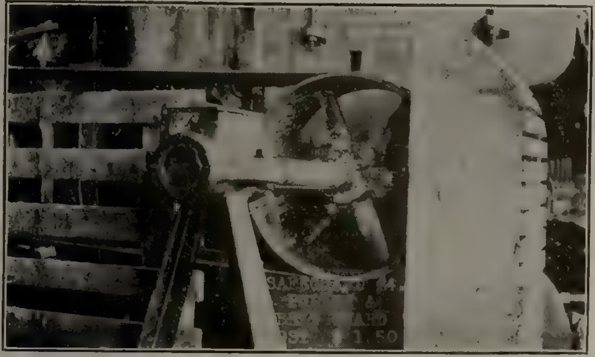
Safety in Paper Mills



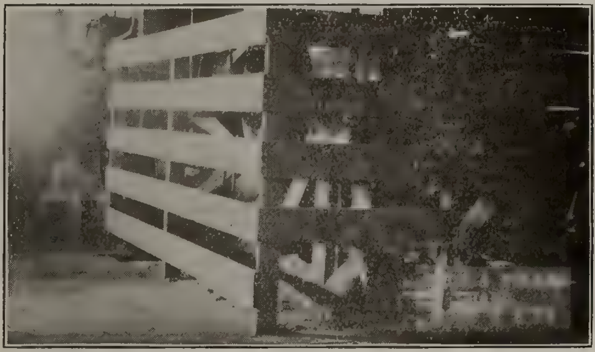
Shaft and Coupling Guard on Paper Machine. Cost, $3.00



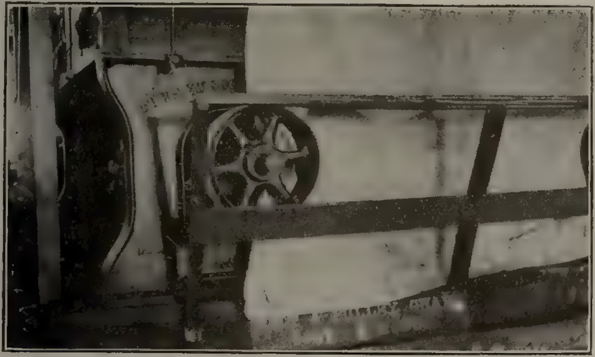
Safeguard Clutch and Pulley Guard. Cost, $8.00



Safeguard Pulley Belt Guard. Cost, $1.50

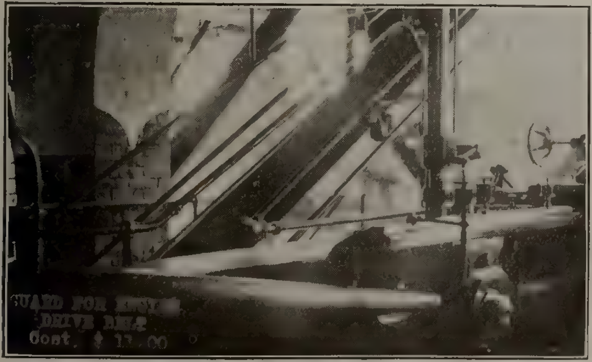


Belt and Pulley Guard. Cost, $2.75



Belt and Pulley Guard. Cost, $2.00

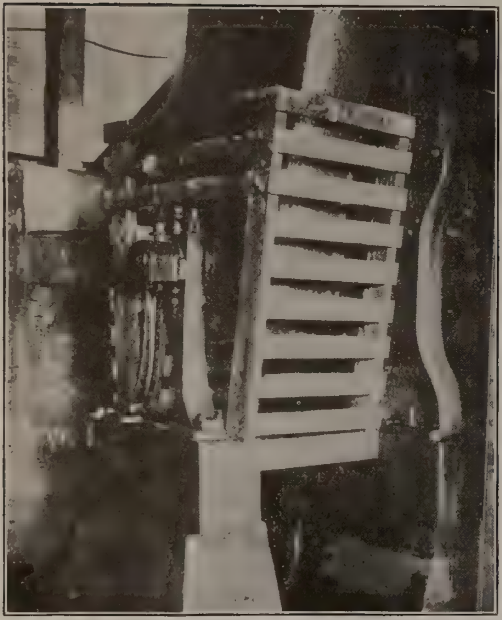
Safeguard Railing Around Sulphur Burners. Cost, $15.20



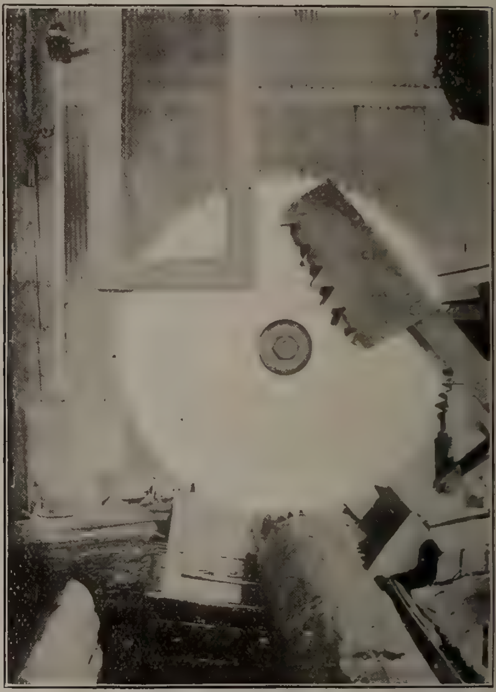
Guard for Engine Drive Belt. Cost, $11.00

Safeguard Bevel Gear Guard Paper Machine. Cost, $2.00

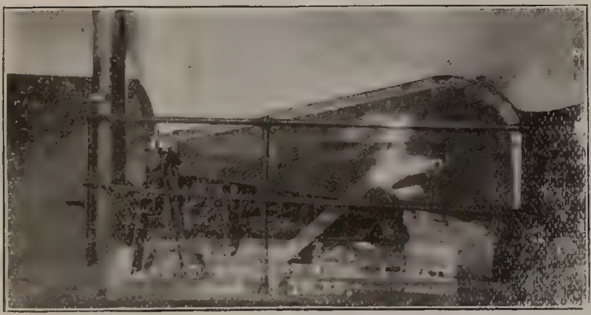
Safety in Paper Mills



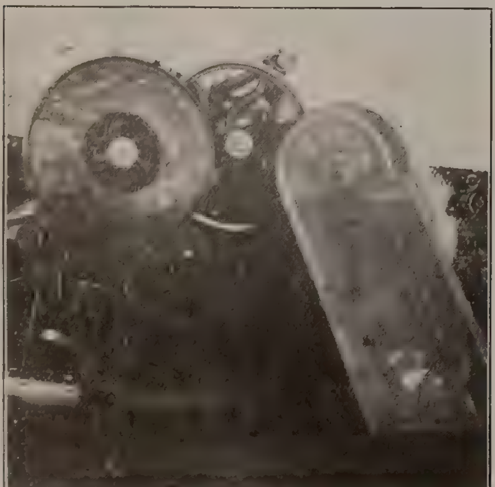
Safeguard Pulley and Celt Driving Screen. Cost, $1.50



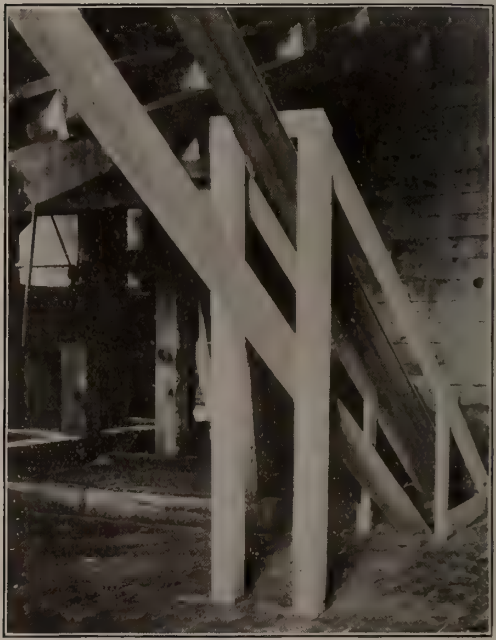
Safeguard Top Saw Guard. Cost, $4.50



Safeguard Guard on Sprocket Wheel and Chain. Cost, $10.85

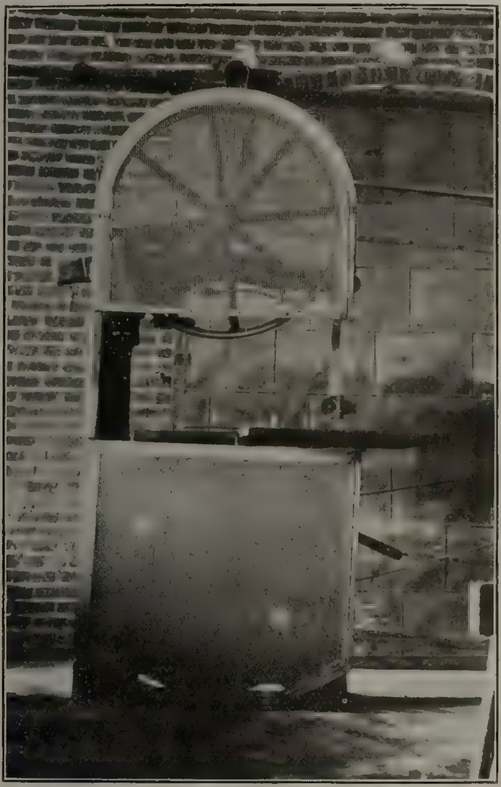


Safeguard Gears and Pulley Guards on Paper Cutter. Cost, $1.50

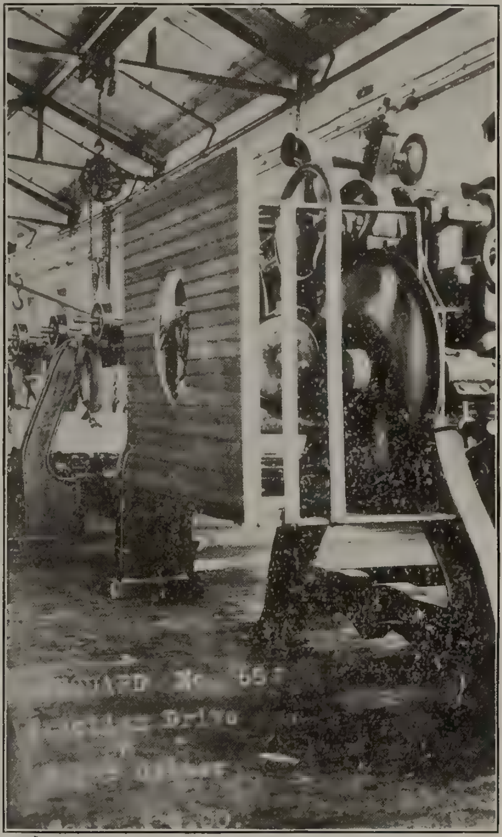


Belt Guard Screen Room. Cost, $3.00

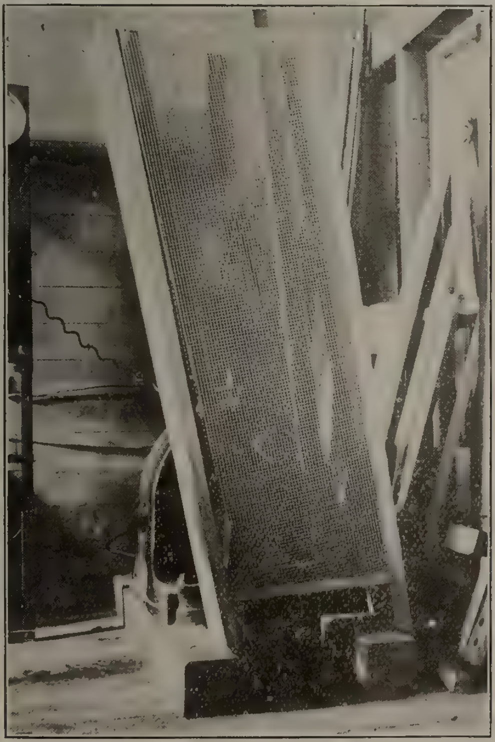
Safety in Paper Mills



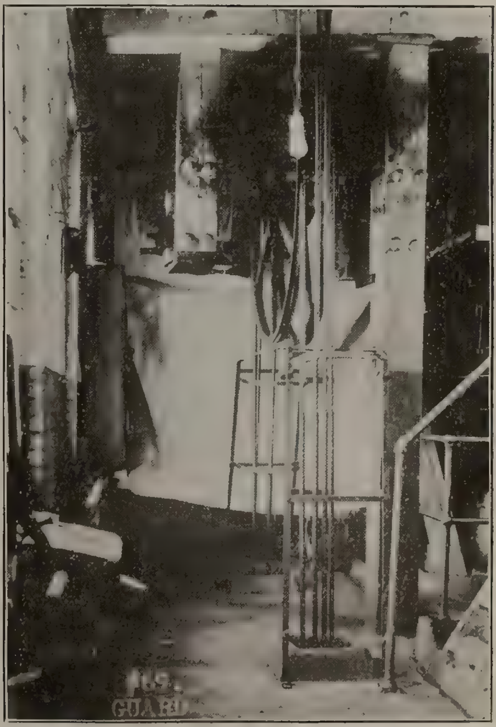
Safoguard on Band Saw. Cost, $7.00



Safeguard Friction Drive on Paper Cutter Cost, $8.00



Belt and Pulley Guard—Motor. Cost, 75c.



Guard on Rope Transmission. Cost, $4.70

A Japanese Paper Mill.

WHY may not imagination trace the noble dust of Alexander till he finds it stopping a bung-hole?” I do not know that a visit to the Omoto paper mill suggests any more useful reflection than this, but the mill is one of the examples of Japan’s adoptions of Western methods, so it deserves a passing notice, though it is neither a show place nor an awful example. It is a little place on the outskirts of Kobe, with a smart new red brick factory on one side where Dunlop tyres are made under European supervision, and on the other a great corrugated-iron steel-works, but coming up to the walls of both are the too-well-manured and elaborately trenched and terraced fields of the Japanese cultivators, with their picturesque little houses and gardens. There was not much that was indigenous about the mill. Even the iron gate that opened on its cinder-paved yard was obviously English. Straight ahead, the first floor was open wide for the reception of bales of waste paper apparently from all the rubbish-heaps in the city. There was no sorting done—unless the better qualities had been abstracted before baling, for the best that was there, was torn Japanese newspapers—themselves, from a literary point of view, one of the strangest conglomerates in existence, and, from a paper-maker’s standpoint, ‘poor whites” indeed. There were broken card-board boxes from England and America, wrappings, handbills, odds and ends from every quarter of the globe. The bales were opened up by women, and foreign bodies, such as match-boxes, string, sticks and rags were taken out when noticed, but no great care was used. Close by stood three oval tubs, about 8 by 5 feet, divided down the middle by a partition which did not quite reach the ends, and with a shaft running across the three, operating a dasher in each tub, the dasher being covered in like a paddle wheel. The scraps from all the world were heaved in by armfuls, while hot water completed the mixture. When the tub was nearly full the water was turned off, the dasher turned on, and the scraps made a procession round the tub. After a few rounds the mixture becomes a fine grade of mud, and is conducted by a pipe down to the paper-making machine, passing upwards through an open chamber on the way, where the last of the sticks and other unassimilables are caught.

Two horizontal steam-engines drive the concern, but the rope drive which operates the mixing tubs is received on a pulley which inclines several degrees; a little ellipsoidal grindstone performs curious evolutions, and as for the numerous belts that drive different parts of the paper-making machine, some are like nothing so much as a ladies’ feather boa draggled and knotted. They must lose a good deal of power between them, but there is plenty of driving for the big machine—a variety of the classic Fourdrinier type, in which the fine mud is poured between two endless blankets, and after several turns round cylinders, leaves the blankets and starts on a long independent journey, under, over and round a dozen more, some of them steam-heated and not too steam-tight. Dry, smooth and with as much cohesion as could be expected, the final grey-brown product is wound off on skeleton drums of wood. At every few dozen turns, the paper is slashed across by hand and taken over to the alternative drum; what is wound off is sawn through with a long knife, and the resulting sheets are laid in a pile on a low platform with half-inch cracks at regular intervals. When the pile is about eight inches thick, a cover with corresponding cracks is laid on it, and a man proceeds to cut it up, thrusting an L-shaped knife through the cracks, beyond the edge of the paper, hooking the blade underneath, and cutting upwards towards himself as he retreats over the cover. The operation is repeated crossways the whole product being reduced to about the size of handkerchiefs. One point to be noticed was that the cutters used the whetstone after every cut (not the elliptical grindstone). Tool-sharpening is distinctly a Japanese virtue. Even the most ignorant (technically) must notice the difference in this respect between Japan and India from simply visiting the hairdresser. In India the scissors and clipper are means of extraction, while in Japan they cut. But to return to our paper; the squares into which the coarse product I have been describing are cut and used for handkerchiefs, serviettes and every variety of household and toilet use. The Omoto mill is, of course, not typical of the paper industry in Japan, as some of the finest qualities are made in the country; but it is the only mill just in this neighborhood, and has a special interest as a user-up of waste. Even in finer qualities, including patterned wall paper, the same smallness of size in the finished product is usual. The number of shops devoted to the sale of packets of paper of various qualities for household use, including the papering of windows and of lanterns, is surprising. There are in all 165 paper-mills in the country, of which 99 use power. Of these 29 are for the manufacture of European paper, and employ 4,968 male and 1,528 female operators, and produce paper of the value of Rs. 2,46,00,000 annually. The Government statistics reckon those employed in the manufacture of Japanese paper by families, of whom 54,917 are engaged; these decline by nearly 2,000 a year, though the value of their product increases. The makers of European paper have increased about 80 per cent. in ten years, and the output has increased in value about 120 per cent. The ‘European” paper made is chiefly common printing, and is manufactured largely from imported pulp. Imports of printing paper (mainly from England and Belgium) amount to about one-eighth of the total consumption. It is a more fluctuating trade than that done in the home-made article, the explantion being that the local enterprise has not yet overtaken the minimum demand, and that fluctuations are met from a foreign supply. The import duties are high enough to make it impossible for cheap foreign printing paper to compete with the Japanese, but are not so exorbitant as to prevent the use of foreign paper when there is a demand. This brings us, of course, to the inevitable consideration whether the making of paper of the European kind is a real commercial success. The kind of which the manufacture is described above is a success; but the figures regarding the market prices of Japanese and foreign printing paper show that the former, on a free-trade basis, would be a good deal dearer than the latter. Of course, as I have said, the supply is not yet equal to the demand, so it may be that the Japanese can produce printing paper at a lower price than the European maker could supply it, but that they take advantage of protective duties to keep up the price; the closeness of the prices seems to indicate this as the true condition of affairs.

As regards the finer qualities of printing and writing papers, import duties have done very little in the way of stimulating manufacture. Perhaps there is no great demand. The Japanese do their correspondence on flimsy paper, painting Chinese characters with a fine brush, and they send it in a long envelope of the same flimsy nature. The amount of the finer qualities of paper and card used make it hardly worth while to go in for the elaboration and expense necessary to compete for the trade.—(Special Representative of Indian Textile Journal.)

LORD NORTHCLIFFE SELLING NEWSPAPERS.

Lord Northcliffe, newspaper publisher, has been suffering severely from weakness for some time past, and as has been cabled, been forced, on the advice of a specialist, to give up most of his newspaper responsibilities and go abroad. Several operations have been performed and Lord Northcliffe suffered intensely and his health generally is bad.

According to gossip in Fleet Street, Lord Northcliffe has got rid of all his immense newspaper holdings, including the Daily Mirror and Daily Mail, while other publications controlled by him have been acquired by his brother, Sir Harold Harmsworth, who was made a baron in the New Year's honors this week. The latter, who superintends the financial part of the Harmsworth publications, is reputed to be much more wealthy than his brother.

It is believed that Lord Northcliffe will retain control only of the Times.

QUEBEC ACTIVE IN FOREST WORK.

The Forest Service of the Province of Quebec now employs a total of sixteen professionally trained foresters.

During the summer of 1913, the Forestry Branch had fourteen parties in the field, each in charge of a technically trained forester. The work undertaken by ten of these parties was a valuation survey of unlicensed Crown timber lands. Of such lands there are approximately 125,000 square miles in the Province of Quebec. The Crown lands under license aggregate approximately 7,0000 square miles. The revenue from these lands during the past year has aggregated nearly one and three quarter million dollars.

In addition to the ten parties engaged as above, four parties were engaged in an examination of licensed lands, to determine the boundaries of permanent forest reserves. It is the policy of the Quebec Government to segregate non-agricultural forests lands into permanent forest reserves as rapidly as the necessary information can be secured.

NORTHERN ISLANDS PULP WOOD CO.

An interesting action was begun in Toronto last week at the Non-Jury Assize Court, Chief Justice Falconbrige presiding, when the Imperial Bank of Canada sought to recover $20,000 from the Detroit Sulphite Pulp Co. of Detroit, Mich. Several witnesses were heard and more evidence will be taken when the case comes up again in March next. The The Imperial Bank affirms that it agreed to advance the Northern Islands Pulp Wood Co. of Port Arthur money to carry on the work of taking out pulpwood from the limits of the company on condition that all wood so cut be given in security for advances. It will be remembered that some time ago the Northern Islands Pulp Wood Co. assigned and the assignee, G. T. Clarkson, of Toronto, is calling for tenders for the assets of the company which will be received up to March 18th.

The Imperial Bank stated that the Detroit Sulphite Pulp Co., which owned the limits of the Northern Islands Pulpwood Company, had agreed to take under an arrangement in 1910, from 15,000 to 20,000 cords of pulpwood annually from the Northern Islands Co., which was given the privilege of cutting on the limits of the former concern. The Northern Islands Co. was to receive $9 a cord. Furthermore, the Imperial Bank stated that the Detroit Company had agreed to accept all drafts drawn upon it by the Northern Islands Co. in favor of the Imperial Bank when shipments were made. In August, 1911, the plaintiff stated that shipments of some 1,550 cords were made by boat to the defendants, and, in accordance with the agreements, a draft of $10,850 made out with bill of lading attached. Though the defendants took the wood they refused to accept the draft. A further shipment of 1,100 cords was made and a draft drawn for $6,000, which met with a like reception. In defence the Detroit company, which admits a trustee interest in the latter, stated that though the Northern Islands Co. had acquired the privilege to cut on their limits, no agreement to buy a specified amount of pulpwood had been entered into. That if the plaintiffs had a lien on the pulpwood of the Northern Islands Co. it must be only upon 8,000 cords, and upon that cut prior to 1910, as all wood cut after that date stood as security for a loan of $70,000 advanced by the Union Trust Co. to the Northern Islands upon the credit of the defendants. The defendants also stated that, contrary to the bank's allegations, no bills of lading had been attached to the drafts and that the plaintiff had no lien on the cargoes. The defendants stated that if the bank got a lien on the pulpwood of the Northern Islands Co. it was to pay off certain promissory notes which had been paid, that there is some $36,000 coming to the defendants for stumpage at the rate of $1 a cord, which, in addition to other liabilities, made a debt of $100,000. Finally, after citing the statute of frauds in defence, the pulp company stated that the wood supplied was not up to grade and not worth $9 a cord.

The directors of the District of Columbia Paper Manufacturing Company at Washington, D.C., declared a dividend of 1½ per cent. to stockholders of record January 15th, and payable January 20th.

The British Markets Past and Present.

(By Our London Representative.)

The Paper Industry.

I have waited for the production of the Trade Board returns, which were issued on January 6, before attempting to guage an idea of what the paper industry and the pulp importations of the United Kingdom have been like in 1913. Various reports have been written on the state of these industries in the London Press and elsewhere, and I gather from them the information that "everything has been satisfactory." Paper manufacturers in various parts of the United Kingdom, however, are not of this opinion, and the Trade Board figures bear that opinion out to a niceity. From the information that reaches me from different sources, I find that the export trade of the British mills in paper and boards has been on the decline since September, when compared with 1912, and added to this are the facts that coal and materials used in the production of paper and boards are on a higher level. Prior to September trade was going satisfactorily and there was every prospect of a good year. Some mills, of course, did better than others and to make matters worse the paper manufacturers are not in a position to ask a higher price for their products in order to meet the increase in the cost of production. Roughly, there are 257 mills turning out paper and thirty-eight making boards in the United Kingdom, and commencing in Scotland I learn that, with the exception of the last three months perhaps, when slackness set in, trade was fair during the whole year. The price of coal was keenly felt and there was no advance in prices for manufactured goods except in the case of a few lines. Messrs. Alexander Price & Sons, Ltd., Aberdeen, state that the prices of raw materials, including coal, have been very high throughout 1913, but the increase in the cost of production has not yet been followed by a corresponding increase in the prices for paper, etc. Prices, however, show a tendency to firm and with a continuance of the present steady volume of trade the prospects of the coming year are very fair. In Lancashire some of the mills towards the latter part of the year showed a great scarcity in orders, but the slackness was most felt in Bradford. The head of a large firm in Bradford stated that there was a considerable falling off in trade from the very beginning of the year—during the time when people were talking and writing about a boom in trade. The reason he ascribed to this slackness was the stringency in the money markets and political unrest, as a result of which very small quantities of pulp reached Bradford from Canada and Newfoundland. In London the paper demand was fair up to September and from this on there was a dullness in business, with the result that agents and millmen were complaining. According to the Trade Board returns, the following figures show the state of the industry in 1913:

	cwts.	1912	cwts.	1913
Exports	3,329,461	£3,559,317	3,499,513	£3,678,680
Imports	12,217,807	£7,234,437	12,881,860	£7,674,539

These figures include writings, printings, millboards, playing cards etc., and it will be observed that the exports of the British mills fall 52 per cent below the imports of foreign and colonial mills —the latter contributing no less than 37 per cent. in packings and wrappings. Of the exports 6,731 cwts. of writing paper in 1913 went to Canada, an increase of 770 cwts. compared with 1912; 121,649 cwts. of printing paper, a decrease of 299 cwts. compared with 1912; and 3,863 cwts. of unenumerated paper compared with 4,187 cwts. in 1912. The monthly returns for December, November, October and September show a decline in British exports of paper and boards generally. In the imports, net return is given separately for Canada, the only figure available being those of Newfoundland which show that printing paper was exported to England to the extent of 860,123 cwts., compared with 790,653 cwts. in 1912. At the time of writing I find that trade is back again to its normal level and paper manufacturers are hopeful of business brightening up during the first couple of months of 1914. They believe that a new turn of events is close at hand.

The Chemical Pulp Trade.

When the paper trade is dull it is only natural for the chemical pulp business to be featureless. That is the state of affairs just as I write, though concessions may be obtained in sulphite and sulphate by careful buyers. The prospects for 1914 are very hopeful and everything points to a fully successful year. Glancing back over 1913, I find that chemical pulps are cheaper at the end of the year than was the case at the beginning, but this is accounted for by the concessions Scandinavians have been making owing to disappointments brought about by the States tariff. Up to December 1st prices all along were very firm, but the amount of business done in the first six months of the year more than trebled that of the latter part. Towards September prices were not acceptable to buyers, and the Norwegian and Swedish mills contented themselves by waiting from July onwards for the outcome of the States tariff question. They decided not to flinch one iota and this attitude kept quotations on a high basis in the British market. At the end of the year prices became easier somewhat. According to the Trade Board returns the British demand in 1913 was as follows:

	1912 tons	1913 tons
Chemical, dry bleached	20,101	20,621
Chemical, dry unbleached	381,496	374,684
Chemical, wet	14,797	16,498

There is a constant steady consumption of pulps in the United Kingdom and it is very gratifying to record that Canada's exports have been well maintained, but as to the actual figures I am not in a position to give them owing to the classification carried out by the Trade Board, Canada being placed under the head of "other countries." A true retirn, however, is made in June of Canada's trade with England. Prices of chemical pulps in the United Kingdom are about as follows today: Bleached sulphite $52.80 to $57; easy bleaching sulphite (No. 1), $41.70 to $42.70; sulphite news, $38 to $43; unbleached soda (No. 1), $37 to $43· unbleached soda, (strong) $36 to $38. Soda kraft, $38.40 to $39; all quotations c.i.f. British ports.

Mechanical Wood Pulps.

The past year has been a remarkable one for mechanical pulps, and like chemical pulps, British mills have adopted the policy of entering into contracts covering a period of several years. It is to this policy I desire particularly to draw the attention of pulp producers in Canada and they should keep in constant touch with their agents in London and Manchester with the object of capturing some of these long contracts when they expire. Canada has been in the fortunate position of getting a few good contracts, but I would like to see more going to the Dominion. Canadians can put the pulp in the British market just as cheap as the Scandinavians and Germans if they go the right way about it—and Canadian pulp is much appreciated—and a five or six years contract is worth looking after. Therefore, let us hope that 1914 will see a little more energy on the part of Canadians in the British market—particularly those who have agents to pave the way for business. Mechanical moist in 1913 fell to as low a price as $9.12, but this was attributable to mills being well stocked and the price quoted was for prompt delivery. In the first part of the year the demand was good but the latter half saw business very dull. Generally prices at the close of the year were very much easier than was the case at the beginning of the year. Canada and Newfoundland have in 1913 taken a very prominent position in British imports of mechanical pulp, and it is to be hoped that position will now be maintained, particularly as the consumption is expanding steadily. The imports of the United are as follows in 1913:

	1912	1913
Mechanical, dry.........	15,788	8,967
Mechanical, wet.........	493,408	557,187

Of the mechanical wet in which Canada is more interested, I find that out of the total of 557,187 tons the Dominion contributed 69,090 tons, the balance going to Sweden and Norwegian manufacturers. These 69,090 tons show an increase of 26,692 tons over 1912, which is most satisfactory. If the ratio of increase in 1913 could only be kept up in 1914, in another two years the Scandinavians would find Canada an important competitor in the British market. Prices today for mechanical are about as follows: Pine 50% moist, $10.20 to $11 for prompt; pine dry, $22 to $23 for prompt. All prices c.i.f. British ports. For forward delivery add half a dollar extra.

THE MANUFACTURE OF VISCOSE.

The chemical pulp used for making viscose must be as pure as possible. According to "Der Papier Fabrikant" is must have only a small percentage of ash and contain but few constituents which are soluble in soda lye (wood gums). Chemical pulp bleached too much is very injurious owing to its percentage of oxy-cellulose, and on the other hand chemical pulp bleached too little can not be employed. Recently large chemical pulp mills have paid special attention to the manufacture of chemical pulp for making viscose.

The chemical pulp is not cleaned with hydrochloric acid or hydrofluoric acid as one sometimes reads. The boards are first cut into handy pieces and slightly dried. The drying may not proceed too far and on no account may it cause the chemical pulp to turn yellow. The chemical pulp is first treated with soda lye. The duration of the treatment may fluctuate between thirty minutes and six hours and must be found by trial for each chemical pulp. In some works it lasts indeed twenty-four hours and longer. The saturation with soda lye takes place generally in large iron tanks filled with soda lye in which the chemical pulp weighed out in wire baskets is suspended. After the action is sufficient the excess of soda lye is removed by hydraulic pressure or by a centrifuge. The latter is to be preferred because the percentage of lye in the pulp is then more uniform. The centrifuges must be fairly large, have a high speed and consist of the best material. The middle part of the centrifuge remains free in order that the lye may be thrown our very uniformly.

After being centrifuged the chemical pulp must have rather more than three times its original weight. Quite definite limits must be maintained which are dependent on the nature of the pulp. The pulp then passes through machines which are arranged similarly to those of the well-known kneading machines, which supply a loose mass like crumbled white bread; a rise in temperature occurs which must not be too great. The mass thus obtained is left for some time, when certain temperature limits will likewise be observed, if necessary, by cooling or heating the rooms in question. The board must remain moist and the percentage of sodium carbonate should not rise too high.

For the conversion of the alkali cellulose into the xanthogenate a simple rotating drum is used, in which the material is thoroughly mixed with bisulphide of carbon; 30 to 33% suffices, a larger admixture being directly injurious. Preferably the process is stopped when the product has a slight yellow or orange yellow color and is not continued until the initially loose mass becomes lumpy. Another sign for the termination of the process is given by a certain rise of temperture.

When working with bisulphide of carbon the same precautions are requisite as with benzine. During the rolling of the mass in the drum all blows and scratching movement between parts of iron must be avoided. Further, when bisulphide of carbon is inhaled poisoning readily occurs. Therefore the rooms in which bisulphide of carbon is employed must be built as large and airy as possible. The illumination must be from the outside, and when people are present both windows and doors must always be open.

The finished xanthogenate is dissolved in water of condensation or distilled water containing some soda lye. A large admixture of soda lye diminishes the viscosity.

Of the many precipitation agents sodium bisulphate, ammonium sulphate mixed with glucose, and thiosulphate come principally into question.

The Davy Pulp and Paper Co., at Thorold, Ont., are putting in a new grinder after the Voith system, a magazine that will hold twenty cords at each charging with automatic trip presses.

British Trade News.

(Special to the Pulp and Paper Magazine.)

London, January 18th, 1914.

Last week a series of mishaps befell the raw materials and the fabric of the Culter Paper Mills, near Aberdeen, Scotland. The first loss was in Aberdeen harbor, where a cargo of Esparto Grass was lying in a steamer waiting to be discharged for the mill. In the fore-hold of the vessel fire broke out and a quantity of the grass was destroyed but the remaining portion in the aft-hold escaped being damaged. This portion of the grass was removed to the mill—an old portion of the mill which is set aside for the Esparto and rags. The next mishap was in the electricity. A wire was fused and an outbreak of fire occurred, but the engineers hastily summoned the well-equipped mill fire brigade and they lost no time in extinguishing the flame. It should be mentioned that the Cutler mills are about the most up-to-date paper mills in Scotland and are electrically fitted out, in addition to other modern requirements. The last mishap occurred to the old part of the mills where the Esparto and part of the rags were. Here a fire broke out on the night of the 11th and completely destroyed the building, the damage being estimated at $38,400 which is covered by insurance. The raw materials were destroyed, but fortunately the mill remains intact otherwise and work is proceeding apace.

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An attempt is being made by trade unionists—and paid organizers—to introduce the union label on the same principle as that adopted in America. The glowing bait is held out to the British paper manufacturer that the label will be the means of advancing the consumption of British-made paper and will also help to lessen the supply of foreign-made paper in England. In other words it is contended that the label will encourage home manufacture and home industry, and the peculiar part of the whole business is that the trade unionists who are laying out this scheme are rabid free traders, and against their principles and policy are arguing a case in favor of the protectionists. "But it is an ill wind that blows nobody good." Needless to say, paper manufacturers are all smiles on this new dictating element that has suddenly arisen and one or two newspapers look on the scheme with the seriousness of a Solomon. Of course, it would be an admirable policy for the trade unions if the paper mill owners did adopt the label, because it would leave all mills in the power of the unions, and when a crisis came the mills would be at the dictation of a few agitators and a few of the "bright-boys," who could decide whether paper was to be made or not at mills. With the keen foreign competition nowadays British mills can not wait for outside interference and if they once get under the heel of the unions the industry will be turned "topsy-turvey." It may safely be assumed that this label question will cause a split amongst the members of the Paper Makers' Association, as some are in favor of giving into the men, while others are quite the opposite. How the subject will be tackled remain to be seen. There are of course mills today which are recognized by the unions as union mills—that is trade union mills. No one can object to trade unionism as it has been carried out up to now in the mills—in some cases it has done good for the workers—but to force the views on mill owners that by using a label British paper will be protected (while the market is flooded with foreign products) and that if it is not adopted, the offending mills will be held up to "ridicule" and "exposure," (threats of the meanest order) are views that require to be dealt with in the strongest possible manner by employers.

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The Stationers Social Society have elected Mr. W. J. Whyte, a director of Messrs. Edward Lloyd, Ltd., papermakers, to occupy the position of president in 1914. Mr. Whyte will make an ideal president, as he is a man who thoroughly understands the requirements of the stationers, as well as the art of papermaking. He will make his first appearance in his new role next month at the stationers society dinner, at which the Lord Mayor of London (Sir T. Vansittart Bowater) and Lady Mayoress will be present.

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The Bradford paper mills use mostly jute, flax, hemp fibre and a fair amount of wood pulp in the year, but the fibre for the production of the paper is practically all obtained locally from a radius of within ten or fifteen miles of the city. A limited amount of cotton rag is used and practically no esparto grass. The reasons ascribed for the slackness of trade last year in Bradford are many—political conditions, which have interfered with the money markets, the revolution in China, the revolution in Mexico and the war in the Balkans. The disturbance in the Balkans has affected the markets in Germany and Austria, lessening the requirements of spinners who spin on to tubes. Hundreds of tons less of wool are being used, less tops are being combed, and consequently less paper for tops for which Bradford mills cater. Bradford mills are closely linked up with spinners, manufacturers, tube spinners and topmakers.

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In a general sense the past year has been one of difficulties and perplexities to those engaged in the rag trade. Consignors from other countries have been alarmed by the revised charges and new restrictions imposed by the railway companies and the increased cost of transit has had an appreciable effect—and undoubtedly has been the deciding factor in some cases where continental dealers had to choose between the English market and one nearer at hand. As no hopes of concessions are ever entertained it was not long before the new basis upon which business had to be transacted was clearly understood by all parties, and the same remarks apply to the higher rates for carriage. Prospects for the coming year are exceedingly difficult to guage. The most hopeful sign is that even for the rags in least request in mills prices are firm. It is difficult to do business at the time of writing, but there is an underlying feeling of confidence that the new year may improve trade and an average quantity may go into consumption.

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Two men, who described themselves as accountants of Ludgate Hill, London, have been arrested on a charge of conspiring together to obtain money by false pretences. A dentist living in Reading told the court that his daughter in August last, received a letter signed "C. Crumpwell & Co." offering for sale eighty preference shares in the well-known papermakers, Edward Lloyd, Ltd., upon which four months dividend had accrued to the purchaser. He agreed to buy the shares and sent "Crumpwell & Co." a cheque for $420 for which he never received any transfer and had no further communication from "Crumpwell & Co." For a long time he considered the transaction was genuine and that the delay was attributable to the holiday season. One of the prisoners was discharged and the other was sent to the London Criminal Court to be sentenced to imprisonment.

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The half-yearly meeting of the Bury Paper Making and Manufacturing Company, Gigg Mill, Bury (Lancashire), was held recently. The report for the half-year ended November 29th, showed that there was a gross profit on trading account of £7,290 10s. 10d. After charging the account with interest, depreciation, etc., amounting to £3,082 19s. 11d., there was a credit balance of £4,207 10s. 11d. as a net result of the half-year's working. To that was added the balance from last half-year amounting to £13,260 12s. 5d., which made a disposable balance of £17,468 3s. 4d. The directors recommended a dividend of 10 per cent per annum on the 10 per cent. preference shares, ten per cent. per annum on the six per cent preference shares, and 10 per cent. per annum on the ordinary shares, plus a bonus of 2½ per cent. on the 6 per cent and ordinary shares, amounting altogether to £3,297 4s. and the carrying of a balance of £14,170 19s. 4d. to next half year's account. The meeting adopted the recommendations. Mr. James Preston, the president, and the directors of this mill deserve to be complimented on their success. Their success is an answer to the recent contention of some gentlemen in the Southern mills of England. It shows that the Northern mills are quite capable of looking after themselves in the paper market of the United Kingdom, including that of London.

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The report of Baryta, Ltd., states that the directors are glad to report satisfactory progress in the business of the company. Baryta-coated papers made under the company's processes, are now being produced on a commercial scale. The company's technical staff has been employed during the last year at the laboratory and at the factory in Germany on important work in overcoming technical difficulties inherent in all new processes of manufacture. As a result of this work perfect papers of all grades have been produced, and an interesting business is now being secured in Germany to supply baryta-coated papers to the trade, and also in ceramic papers used in the manufacturer of pottery. The installation at the company's factory at Watford, near London, is now completed and will be turning out finished photographic papers by the end of February.

United States Notes.

Secretary P. S. Ridsdale, of the American Forestry Association, has secured a ruling from the Treasury Department on the method by which the income tax on timberlands may be estimated. The Department says that office is of the opinion that "the gain from the cutting and disposal of stumpage is realized in the year during which the timber is cut and disposed of, and that the amount received in excess of the cost of such timber is profit, and should be so accounted for as income for that year." This decision was based upon the request for information pertaining to stumpage values of the yearly growth of timber, whether cut or not, and to whether an income tax, based on the value of the timberland, would or would not be assessed. It is understood that no timberland will be subject to the tax until the timber is cut and marketed.

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The Associated Dealers in Paper Mill Supplies of New York has arranged to hold its annual dinner and vaudeville in the grand ballroom of the Hotel McAlpin of New York, on Wednesday, February 18. In order to give the affair a good start, the association voted, at its January meeting, to take twenty-five tickets for distribution among honorary guests and members of the press. As preference in seating will be given to early applicants, it is important that all who expect to go, send word, together with the number of guests they have, and the fee of $5 for each, at as early a date as possible, to either Fred H. Chase, secretary of the association, 145 Nassau Street. The committee consists of R. B. Atterbury, Fred H. Chase, James Pirnie, Daniel M. Hicks, and Adolph Salomon of 140 Nassau Street.

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The eleventh annual meeting of the National Paper Trade Association of the United States will be held at the Waldorf Astoria, Fifth Avenue, and Thirty-fourth Street, New York City, on Wednesday, February 18th, at 10 a.m. The association will hold its fourth annual banquet and vaudeville on the evening of the day of the annual meeting, February 18th, at the Waldorf Astoria, Fifth Avenue and Thirty-fourth Street, at 7 o'clock. The ladies are most cordially invited to attend, and from present indications a large number will be present. The members are also privileged to invite their friends (and their ladies) engaged in the paper business. The price of the banquet and vaudeville has been fixed at $8 per person. The attendance last year numbered 324, and the committee is proceeding on the assumption that at least 350 tickets will be disposed of this year. Applications for tickets should be made to William C. Ridgway, Corresponding Secretary, 41 Park Row, New York City, at once, giving him the names of those who will attend and accompanied by the proper remittance check to his order. In alloting tables, it is essential that the names of those who will attend be given. The committee urgently requests that all applications be made prior to February 12th.

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The Carthage Sulphite Pulp & Paper Company of Carthage and Brownville, N. Y., has just filed complaint with the Interstate Commerce Commission at Washington against the New York Central

& Hudson River Railroad, et al, in which they charge that rates of seventeen cents, twenty-two cents and twenty-five cents on shipments of wrapping paper, box board, wood pulp board, etc., to Baltimore, Philadelphia and Richmond are excessive, unreasonable maximum rates and for reparation for past grievances.

* * * *

Director Harris, of the United States Census Bureau, and William M. Steuart, chief of the Bureau of Manufacturers of the Census, listened to some severe criticisms and many suggestions from an assembly of manufacturers and trade leaders on how to conduct, compile and improve the census of manufacturers in the United States for 1914, which will be taken during 1915, at a consultation meeting held in the directors' room at the Merchants' Association of New York, last Thursday.

* * * *

Among other things, the census takers were informed that the methods pursued in the classification of past industrial surveys were most unsatisfactory to the manufacturers. Arthur C. Hastings, president of the American Pulp & Paper Association, was one of those who criticised the Federal compilations in the past as having no particular value to the pulp and paper indus (try because of the arrangement of grouping of industries. Mr. Hastings asserted that the association of which he is the head would gladly undertake the task of gathering and preparing more authentic and detailed data concerning the value of production for all the various mills throughout the United States and also the respective quantities for each grade of paper produced than the government has ever presented hithertofore. He said that business generally is now suffering from a lack of definite knowledge as to how much of our American capital has been transferred into the business abroad, and he urged that the coming census include a detailed study of the subject.

* * * *

A suite for $5,000 damages was filed in Superior Court recently ny Henry H. Wilson, against the Ferdinand Funke Sons, manufacturers of paper and paper products, at Evansville, Ind. Henry and another employee in the mill, was injured October 18th. Wilson and another employee were unloading a car. They were almost through shortly before 6 o'clock. John Funke, one of the defendants, and his foreman came into the car. In order to finish up the work quickly they took hold of the bale of paper that Wilson and his partner were carrying to the door. At the door Funke and the foreman gave the bale such a hard swing that Wilson was carried along with the bale of paper. He was thrown heavily to the ground and against a stack of lumber and permanently injured.

* * * *

The John Single Paper Company, of Syracuse, N. Y., has purchased a piece of vacant property in West Jefferson Street, between Onodaga creek and West Street, upon which the company will build a four-storey fireproof building next Spring. The property was owned by the American Express Company and was formerly the site of the downtown factory of the Will-Baumer Company.

I. H. Franks, London representative of Castle Gottheil & Overton, of 200 Fifth Avenue, New York, arrived in this city from England on the steamship Baltic, January 9th. Since that time Mr. Franks has been calling on friends in the trade whom he has not seen since his last trip to America three years ago. He is stopping at the Hotel Seville, where he expects to remain for the next three or four weeks. Mr. Franks in an interview with your correspondent stated that the paper stock trade in England had been very good up to a few months ago when a falling off which, he feels is probably only temporary, began. This seems to have been a reflection of the conditions existing in America at the same time. In closing, Mr. Franks said, "When the new conditions have adjusted themselves here, there will undoubtedly be a rise in business abroad, but whether this will be rapid or gradual, only the future can tell."

* * * *

Frank H. Hoberg, of Green Bay, Wis., president and general manager of the Hoberg Paper Company one of the leading paper manufacturers of Wisconsin was married quietly on January 8th to Miss Gertrude Samuelson of Marinette, the Rev. Mr. Hummel officiating.

* * * *

Jerre C. Mosher, assistant manager of the Whiting Plover Paper Co. plant at Wis., during the past four years has tendered his resignation to take effect February 1st, 1914. Soon thereafter he will leave for New York city to open a wholesale paper establishment. Mr. Mosher is thorough in his line, and for several years before coming to Stevens Point was engaged in the paper jobbing business at Omaha, Neb.

* * * *

Solicitors Gordon and Hening to-day petitioned Court of Common Pleas No. 2 for an injunction against the Philadelphia Paper Manufacturing Company to restrain the defendants from continuing the alleged encroachment of its property in the bed of Nixon St., Twenty-first Ward. The company has a plant on Nixon St. 1,000 feet north of Fountain St. Nixon St. is a 40-feet wide thoroughfare, extending from Leverington Ave. to Port Royal Ave. When the company made recent additions and extensions to its buildings, it is averred the lines of the street were disregarded, and it built 18 feet in to the bed of Nixon St. The city maintains that this was an encroachment on and au illegal possession of a part of the streets.

* * * *

A new firm has been organized at Bellows Falls, Vt., the Standard Paper Company to make gummed papers of all grades similar to the manufacture recently established here by the Liberty Paper Co. The proprietors are A. P. Brookhouse and Rowe C. Wales. The company will occupy quarters in the building near the paper mill of the Robertson Paper Co. under the hill, formerly occupied by that corporation for making waxed papers. The two men were connected with the Liberty Paper Co. until recently.

* * * *

For the first time since the building of the immense paper mill plant in Averyville, Ill., which has recently been completed, the trade may know who the real owners are. They are the Bemis Brothers Bag Company of St. Louis, according to a warranty deed filed in the county recorders office several days ago. The deed transfers the whole paper plant from the supposed owner Ernest B. Roberts, of Cambridge, Mass., to the Bemis Brothers for the sum of "one dollar and other good and valuable considerations and specified." Mr. Roberts it is understood, will continue as manager of the plant, which will retain the name of Illinois Paper Company and will be run as a branch business of the Bemis Bag Company in St. Louis.

* * * *

Articles of incorporation were filed with the Secretary of State Thursday by the Pawtucket Glazed Paper Company. The concern is to manufacture, buy and sell coated and glazed paper, and will be located in Pawtucket, R. I. The incorporators are Hugh Linton, Jesse Linton, Hugh E. .A Linton and Carroll M. Linton, all of Pawtucket.

* * * *

M. B. Wadleigh, well-known lumberman of Old Town, Me., has brought suit against the West Branch Dam & Reservoir Co. He claims the water in the storage basin was not handled right last season delaying his logs and making extra expense. He has also sued the Katahdin Pulp & Paper Co. for $5,000 on account of their pulp wood not being properly handled at driving time, it getting mixed with his logs and the sorting out at Lincoln made a delay and extra expense. He also drove it fifteen miles.

* * * *

The Annual Sales Convention of the Beaver Board Companies took place the week of January 5th to 10th, in Buffalo, N. Y. Sessions were held at the auditorium room of the newly enlarged Beaver Administration building. Though some of the Southern, Australian and South and Central American representatives did not attend, fully seventy salesmen were present. Service was the keynote of the convention, service to employees, sales service for distributors and dealers, and most of all, service for consumers. Plans were evolved for the extension of the service departments in every section of the Beaver organization that the Beaver companies might not only be more efficient within the organization, but of maximum value to all who handle or use Beaver Board in any way. While the entire convention looked to the future, the remarkable growth of the Beaver Board Companies during seven years was brought out clearly. One feature of the convention was a trip by special train to the new half million dollar plant at Thorold Ont. The closing of the convention was marked by a large all-Beaver banquet given at the Statler Hotel in Buffalo.

Three buildings were destroyed by fire and five firms put out of business in a blaze which occured recently at the corner of Dundas and Sheridan Streets, Toronto. G. G. Miles' woodworking factory was one of the buildings destroyed, and all the other firms were engaged in the woodworking line. Mr. Miles was overcome by excitement when watching the fire and dropped dead.

CANADIAN PULP & PAPER ASSOCIATION TO MEET FEBRUARY 26th.

The second annual convention of the Canadian Pulp & Paper Association will be held in Montreal on Thursday, February 26th, which will be after the annual meeting of the American Pulp & Paper Association, which comes off on February 19th and 20th.

ABITIBI PULP RE-ORGANIZATION.

It is understood that a re-organization of the Abitibi Pulp & Paper Company, in which New York and Chicago capital is involved, is now on foot, and that negotiations have reached such a stage that the deal may be closed within a few days.

The St. Lawrence Pulp & Lumber Corporation is erecting a big plant which, when finished, will represent an investment of close to a million dollars. There is an irregular group of buildings, mostly one-storey and measuring something like 900 by 200 ft. in plan, forming a complete pulp mill for making high-grade bleached sulphite pulp, together with a digester building covering digesters reaching 160 ft. above the ground. It is to be finished by next September. The buildings have concrete exterior, the interior structure being largely of structural steel with yellow pine roofs.

There is to be an independent steam turbogenerator plant, giving power for both the pulp mill and a saw mill which is being erected separately. A private railroad is to supply the mill with logs from the extensive timber and pulp wood limits of the company, aggregating some 500 square miles. The Dominion Government has undertaken to develop a harbor for safe wharfage for ships up to 6,000 tons burden.

The Running Waters Commission of Quebec has deposited with the Department of Public Works at Ottawa plans for the huge dam which is to be built on the St. Maurice River to conserve the flow and thereby greatly benefit a number of pulp and paper industries on this waterway. The dam is said to be the largest of its kind built in Canada. It will be situated 2 1-3 miles above La Loutre Rapids, 40 miles from Parent and 240 miles from the St. Lawrence River. It will be 1,720 feet long, and will store 160,000,000,000 cubic feet of water, which means that it is nearly twice as large as the Assouan dam on the River Nile in Egypt. Application for approval of the plans has been made and will shortly be granted, it is probable.

Although Opposition members have charged the Government with helping to build up with its tariffs a lumber combine which has been operating in the West and putting up prices there, and although they have made every effort to draw from the Government some intimation of its tariff policy, so far none has been given. It has been announced, however, that the policy to be pursued will shortly be stated. It is understood that it will embody very very few tariff changes, and that there is practically no likelihood of the paper schedules being interfered with in any way.

PULP AND PAPER NEWS

John J. Ross, General Superintendent of the Minnesota and Ontario Power Co. at International Falls, Minn., was at the Soo last week. It is rumored that he has closed an engagement with the Spanish River Pulp and Paper Mills, to take charge of their mills at the Soo, Espanola and Sturgeon Falls, Ont., but this is denied by the officials of the company. It is known, however, that the Spanish River Co. are looking for a suitable man as General Superintendent with supervision over all the plants.

W. J. Sheppard, of Waubashene, Ontario, has been elected a director of the Toronto Paper Manufacturing Co., taking the place on the Board of J. J. Sullivan, of South Brewer, Me. Mr. Sheppard who is a large shareholder in the company, is President of the Georgian Bay Lumber Co., and a Director of the Royal Bank.

The Inland Pulp and Paper Co., which was formed some time ago to take over the business and plant of the Colonial Wood Products Co., at Thorold, Ont., has started the ground wood mill again after being shut down for some time. It is reportep that the Inland Pulp and Paper Co. will grind for the International Paper Co.

Benjamin J. Clark, head accountant of the Montrose Division of the St. Lawrence Paper Mills headed the polls as alderman in the recent municipal election in Thorold. T. A. Weldon, manager of the Montrose Division was strongly urged by many citizens to come out for Mayor of Thorold and was promised the position by acclamation, but had to decline owing to business reasons.

The Pulp Wood Co., a corporation under the laws of Wisconsin, has just been granted a license by the Ontario Government to purchase pulp wood lands and pulp wood timber, and to cut, carry, buy, sell and trade and deliver pulpwood in Ontario, provided that a sum not greater than ninety thousand dollars is invested in these operations. Hugh Keefer, barrister of Port Arthur, has been appointed attorney of the Pulp Wood Company for the Province of Ontario.

The Howell Company, of Toronto, have been appointed selling agents for the Dryden Timber and Power Co., Limited, of Dryden, for New York State, Eastern Canada and Michigan. It is expected that the Dryden Company, whose evaporators are being rebuilt, will resume operations this month. The output will be forty tons per day of pure fibre sulphate pulp.

The new warehouse of the Victoria Paper and Twine Co., which is located at 439-441 Wellington Street W., Toronto, will be occupied by the company by the first of next month. The basement is already being used for storage purposes in the matter of reserve stock. The cost of the new home of the company is $85,000 and all the latest ideas and conveniences in warehouse construction have been incorporated in the buildings, which is four storeys high, well lighted and equipped with every time and labor saving device. The annual meeting of the Victoria Paper and Twine Co. was held at the King Edward Hotel, Toronto, on January 17th, and very gratifying were the reports presented for the past year. All the old officers and directors were re-elected. Among those present were Charles F. Hubbs, of New York, F. Jameson, of Pittsburg, George Beggs, of Rochester, Charles Corning, of Baltimore, W. H. Howe, H. J. Severance and R. W. Gallagher, of Buffalo. After the business meeting the visitors were entertained to a theatre party by Charles V. Syrett, Managing Director of the Company, and among the other guests were L. E. Charles and C. S. Nicholls, of Toronto. The new warehouse of the company was inspected and the members expressed themselves as highly pleased with it and the fine progress that had been made in construction.

William T. Johnson, who for the past few years has been managing director of the George Powley Paper Co., Toronto, has resigned.

J. O. Trounce, who has for some time past been representing D. S. Walton & Co., paper dealers, of New York City in Toronto, has joined the staff of the Continental Bag & Paper Co., and is attached to the Toronto office.

The annual Meeting of the Ratcliff Paper Co., Toronto, was held on January 17th, and the reports for the past year showed a nice advance in business over the preceding twelve months. The officers elected were: President F. L. Ratcliff; Vice-President, T. E. Gain; Secretary, Norman J. Ratcliff. An interesting social feature that took place recently was when Mr. and Mrs. F. L. Ratcliff entertained the staff of salesmen and office managers to a delightful evening at the home of the President, 145 Crescent Road. The Ratcliff Company has been in business for fifteen years and it is rumored that they may in the near future erect a large and well-equipped new paper warehouse, a site having already been selected, their present quarters at 30 West Market Street being too small to accommodate their growing business.

J. G. Whyte & Son, Limited, Ottawa, have been granted a charter with a share capital of $95,000. The company are granted extensive powers and among them are to carry on the business of wholesale importers and vendors of stationery and smallwares, and to manufacture and deal in all kinds of books, stationery, bookbinding machinery and to publish books, etc. The company are empowered to take over and acquire as a going concern the wholesale stationery and other business now carried on in Ottawa by Robert Barclay Whyte and Leslie Patterson Whyte, under the firm name of J. G. Whyte & Son. The incorporators are Robert Barclay Whyte, Leslie Patterson Whyte, Charles H. Schwerdfager, Horace A. Moffatt and Alfred H. Whyte.

Woodworkers, Limited, of Toronto, with a share capital of $40,000, have been granted a charter to buy, sell and deal in timber limits, timber lands and logs and to manufacture and deal in lumber and woods of all kinds and all articles in the making of which timber or wood is required. The incorporators are Louis F. Strickland, Alex. B. Beverly, and Rudolph F. Lembke, of Toronto, Percy E. Heeney and Walter H. Gregory of Berlin, Ontario.

Brown Mechanical Pulp or "Leather" Board

The "Papier Zeitung" publishes a summary of a pamphlet by Zaccharias, on the manufacture of brown mechanical (so-called "leather") boards. Dealing first with the composition of wood, it is stated that fully dried spruce wood contains approximately 53% of cellulose, 14% of other less resistant carbohydrates, including wood-gum, 29% of lignin and 4% of resin, fat and mineral matters. Treatment of the wood with hot water alone removes 12% of soluble matters, chiefly the gummy carbohydrates, but including about 2% of the lignin constituents.

The woods chiefly employed for making leather boards are the coniferous varieties of spruce, fir and pine, occasionally certain percentages of the deciduous woods, such as birch, beech and popular are added. Birch and beech woods are harder and closer in structure than the coniferous woods, but the employment of birch-wood is not advantageous in spite of the higher yield, because it requires a more severe and longer steaming, and the pulp produced is very short and free. Beech-wood also requires a longer steaming, and the pulp has a very dark color, nevertheless it is greasy and the best leather boards are made of a mixture of two-thirds of coniferous wood with one-third of beech, because the latter gives a closer board which is harder and takes a better finish than one made entirely of spruce or pine. Poplar wood is very soft and spongy, it is easily pulped but does not improve the quality of the board.

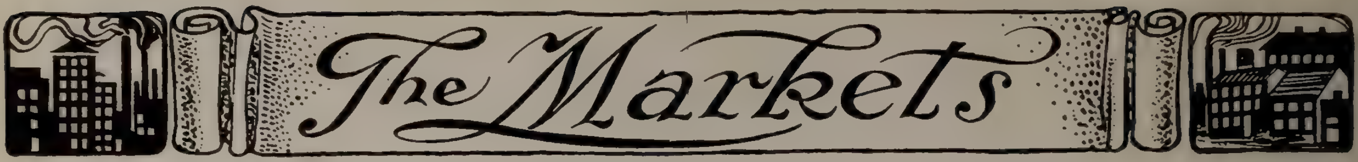
The time and pressure of steaming must be adjusted to the nature of the wood to be ground, the quality of stuff to be made and its color. Pine-wood is most commonly employed and is steamed for about ten hours under a pressure of 3½ to 4 atmospheres. A higher pressure is not advisable owing to the resinous nature of the wood. Fir and spruce, on the other hand, being less resinous, may be steamed under a pressure of six atmospheres for six hours, whereas birch and beech require much longer. Long steaming causes the wood to grind much greasier and the board takes a better finish. Fresh, green or damp wood must be steamed for a longer time than dry seasoned wood. For a cubic metre of well steamed wood a consumption of 400 to 500 kilos. of steam is required. It is advisable to grind the logs shortly after steaming, as wood which has been allowed to dry up again is more difficult to grind and does not yield such a good pulp. Nevertheless, it should not be ground directly out of the boiler as the stuff then shows a great tendency to froth. As a rule the stones used for grinding steamed wood are coarser than those used for ordinary white mechanical. Brown mechanical pulp is very much stronger than white, but its color is against its general application. Paler stuff can be made by slow steaming under a pressure of 1 to 1½ atmosphere. Also a paler color can be obtained by boiling out the wood with water under pressure in which treatment the addition of oxalic acid to the water assists the color; the greater consumption of steam by this process is compensated by the better quality of the pulp. To a certain extent the brown color of steamed wood is due to the pressure of air in the steaming chamber. The digesters may be either horizontal, vertical or rotary, the last consume more power and are not so easily insulated and wear more rapidly, but in spite of these defects they are often preferred. A very good pulp is prepared by a patent process in which the wood is alternately boiled in water and steamed under pressure; the pulp produced is superior in strength and quality to ordinary steamed pulp. Leather boards and papers made from steamed mechanical may be dyed in the pulp or surface-stained by means of basic or direct dyestuffs.—(Specially translated for the "World's Paper Trade Review.")

HOW SAMPLES OF LYE SHOULD BE OBTAINED FROM SULPHITE COOKINGS.

Probably every pulp maker is convinced that the lye is fully utilized in his works, but this is frequently a great mistake due to the samples being improperly obtained. Generally the lye is run off from the try cock into a copper beaker or a glass vessel, cooled slightly or not at all and then titrated. The SO_2 has, however, the property when heated or agitated of being changed from the liquid into the gaseous form, and as the test of lye is agitated and heated very greatly when drawn off the SO_2 for the most part escapes and cannot be found when titrating. If a digester whose total contents of SO_2 amounts to 3½ to 4 per cent. is heated up to 100 degrees C. without letting off gas hardly more than a total of SO_2 amounting to 2 per cent. will be found.

Therefore, if it is wished to determine the correct percentage of SO_2 in the lye, connect to the try-cock an india rubber tube or a leaden worm of thin piping, whose end is provided with a cock, and place the worm in cold water. Then run off the lye cold, titrate the same, and it is surprising to find how strong the lye still is.—

Der Papierfabrikant.



The Markets

Canadian Markets

The market conditions continue fair and news print is in good demand and prices firm. One mill which was looking for orders has been taken care of and the outlook for the coming season is splendid particularly from an export standpoint. Book and writing plants report that the number of orders are improving, and they are looking forward to a busier period. In spite of the fact that 1913 was in many respects a non-expensive year in trade, owing to the money stringency and the curtailment of various operations, the volume of business done by the paper houses is reported, with very few exceptions, to be ahead of the previous twelve months. There is still some price cutting in manilla fibres and krafts, but this has been going on so long that it has become a part of the trade conditions as it were, and jobbers say that there has on the whole been less during the last twelve months than in 1912. The demand for ground wood pulp is rather quiet and the sulphite situation is a little easier, owing to foreign competition. Water conditions are generally reported favorable. Most of the mills have contracts covering the major portion of their outputs for 1914. The rag and paper stock market is exceptionally quite, mixed papers and other lines being still off. Most mills have just got through taking inventories and will ont enter the market for any large supplies until later in the season.

Quotations f.o.b. Toronto, are:

Paper.

News (rolls) $42 to $44, delivered in car load lots.
News (sheet) $44 to $48, delivered in car load lots.
News (sheet) $53 to $56, delivered in less than car load lots.
Book papers (carload) No. 3, 3.75c. to 4.50c.
Book paper (ton lots) No. 3, 4c. to 4.50c.
Book paper (carload) No. 2, 4.25c.
Book paper (tons lot) No. 2, 4.50c. to 5c.
Book papers (carload) No. 1, 4.75c. to 5.25c.
Book papers(ton lots) No. 1, 5.25c. to 7.50c.
Writings, 5c. to 7½c.
Sulphite Bond, 6½c. to 8½c.
Grey Browns, $2.35 to $2.75.
Fibre, $3.00 to $3.75.
Manila B., $2.50 to $3.25.
Manilla No. 2, $3.00 to $3.50.
Manilla No. 1, $3.00 to $3.75.
Unglazed Kraft, $3.75 to $4.50.
Glazed Kraft, $3.75 to $5.00.

Pulp.

Ground wood (at mill), $15 to $16.
Ground wood, $22 to $24, delivered in United States.
Sulphite (unbleached), $42 to $44 delivered in Canada.
Sulphite (unbleached), $43 to $45, delivered in United States.
Sulphite (bleached), $56 to $58, delivered in Canada
Sulphite (bleached), $58 to $60, delivered in United States.

Paper Stock

No. 1 hard shavings, $1.87½ to $1.90.
No. 1 soft white shavings, $1.70 to $1.75.
No. 1 mixed shavings, 50c.
White blanks, 82½c. to 85c.
Ordinary ledger stock, $1.20.
Heavy ledger stock, $1.40 to $1.50.
No. 1 book stock, 70c.
No. 2 book stock, 45c. to 50c.
No. 1 manila envelope cuttings, $1.10 to $1.15.
No. 1 print manilas, 65.
Folded news, 50c.
Over issues, 52½c.
No. 1 clean mixed paper, 30c. to 32½c.
Old white cotton, $2.50 to $2.75.
Thirds and blues, $1.30 to $1.32½.
No. 1 white shirt cuttings, $5.00 to $5.25.
Blue overall cuttings, $3.50 to $3.62½.
Black overall cuttings, $1.75.
Black linings, $1.75.
New light flannelettes, $4.50.
Ordinary satinets, 75c.
Flock, 90c.
Tailor rags, 65.c

Quotations f.o.b. Montreal are:

Book and News Paper.

Roll News, $41 to $43 per ton for large orders; $45 to $50 per ton for small orders.

Ream News, $45 to $47 per ton for large orders; $50 to $75 per ton for small orders.

No. 1 Book, 5¼c. to 6c. per lb.

No. 2 Book, S.C., $4.60 to $4.75 in large quantities $4.75 to $5.50 in small quantities.

No. 3 Book M.F., $4.10 to $4.25 in large quantities $4.40 to $4.50 in small quantities.

Mostly all paper houses allow a discount of 2% to 3% for payment in 30 days.

Wrappings.

Grey Brown, per 100 lbs., car lots, $2.35; 5 tons, $2.45; 2 tons, $2.55; 1 ton, $2.56; less, $2.75.

Red Brown, car lots, $2.85; 5 tons, $2.95; 2 tons, $3.05; 1 ton, $3.15; less, $3.25.

B. Manilla, car lots, $2.85; 5 tons, $2.95; 2 tons, $3.05, 1 ton, $3.15; less, $3.25.

No. 2 Manilla, car lots, $3.10; 5 tons, $3.20; 2 tons, $3.30; 1 ton, $3.40; less, $3.50.

No. 1 Manilla, car lots, $3.35; 5 tons, $3.45; 2 tons,

Paper

News (rolls) $42 to $45, delivered.
News (sheet) $45 to $50, delivered.
Book papers (carload) No. 3, 3.75c. to 4.50c.
Book paper (ton lots) No. 3, 4c. to 4.50c.
Book paper (carload) No. 2, 4.25c.
Book paper (tons lot) No. 2, 4.50c. to 5c.
Book papers (carload) No. 1, 4.75c. to 5.25c.
Book papers (ton lots) No. 1, 5.25c. to 7.75c.
Writings, 5c. to 7½c.
Sulphite Bond, 6½c. to 8½c.
Fibre, $3.00 to $3.75.
Manila B., $2.50 to $3.25.
$3.55; 1 ton, $3.65; less, $3.75.
Fibre, car lots, $3.35; 5 tons, $3.45; 2 tons, $3.55; 1 ton, $3.65; less, $3.75.
Kraft, 3¼c. to 4½c.

Most of the manufacturers are quoting 10% less than the above prices to the jobbing trade on the cheaper lines of wrapping.

Pulp.

Sulphite easy bleaching, $43 to $45 per ton.
News quality, $41 to $42 per ton.
Bleached sulphite, $54 to $59 per ton.
Kraft pulp, $3.60 to $4.00.
Ground woods, No. 1, $15 to $16.
Ground wood, No. 2, $22 to $24, delivered United States.

NEW YORK MARKETS.

(Special to Pulp & Paper Magazine.)

Office Pulp & Paper Magazine,
206 Broadway, New York.
January 27th, 1914.

The local chemical pulp market continues to reflect a rather quiet tone, though the situation is somewhat stronger than it was a fortnight ago. Inquiries by paper mills for certain quantities of unbleached sulphite have been rejected by the prediction of local importers that the turn of the year would witness a slight advance in certain lines of chemical pulp. Though buying is not over brisk, being practically confined to withdrawals on old contracts, deliveries are more steady at present and the general undertone of the market reflects a more healthy appearance. That consumers are drawing more freely on their outstanding contracts, leads one to believe that the paper manufacturers are in better shape and more hopeful of the future—at any rate importers express mot soptsimitic views along this line.

Production of ground wood pulp has been greatly reduced in Northern New York during the past fortnight, but on account of the goodly supplies at the consuming points, local agencies have been unable to secure any higher figures for their product. They are, however, very firm in their views, anticipating an early shortage, and refuse to sell any lots below the quotations given below, notwithstanding how large they might be. One pleasing phase to the market is that since the turn of the year consumers have been drawing more steadily on their requirements than they have for some time past, and it is the common belief that as the year advances this market will pick up considerably.

Paper stock of all descriptions is now reflecting a more steadly inquiry. Since the turn of the year paper mills have been drawing more freely on their contracts that they have for some months past. Waste papers, in particular, are reflecting a better movement, especially so in mixed and commons. Though a slight falling off during the past week in magazine and book stocks has been noticeable, it is only thought to be temporary. Mills are quite busy at present and it is the consensus of opinion that 1914 will be a very good year for the packers of all grades of paper stocks. Hard White Shavings are now selling at 1.90c. to 2½c; Soft White Shavings, at 1¾c. to 1.80c.; Colored Shavings at, 55c. to 85c.; Book Stocks at 75c. to 1.05c.; Ledger Stocks at 1.45c. to 1.75c.; White News at 1c to 1.10c.; Old Manillas at 45c. to 75c.; Overissue News at 65c. ton 75c.; Folded News at 43c. to 48c.; Mixed news at 35c. to 40c.; Broken News at 30c. to 35c.; Mixed Papers 27½c. to 32½c. and Common Papers at 20c. to 25c.

While it is too early in the year to make any predictions as to the outcome of the paper industry, it is quite evident judging from a local standpoint of view, that 1914 has started off with good prospects, and it is the common belief that the remaining eleven months, which will not be marred with tariff and other disturbing features, will witness a decided revival in the buying of all descriptions. Locally, both dealers and manufacturers are most optimistic in their views. Buying has picked up considerably since the middle of the month and there is sufficient good feeling evident to keep the spirits of the members of the trade buoyed to the expectancy of a good volume of business for the year. Continued reports of completed inventories show that the past year was a much better one than the closing weeks had indicated it to be, and though the present business is of a spotty character, there is a firmness in prices which insures a confidence in the future. The local market had picked up during the past week to a noticeable extent and trading has assumed somewhat of the aspect presented in advance of the dullness of the closing weeks of the old year. The good feeling is not confined to any particular line, but is most general. All grades are passing freely and a much firmer undertone is noticeable. Manilla and fibre mills are comfortably filled with orders and are somewhat behind in their deliveries. Tissues are very firm in price and enjoying a fair share to active movement in all grades. Book papers are moving freely and as in manilas and fibres, the mills are from two to four weeks behind in their deliveries. Writings, as well as Bonds and Ledgers, are securing their full quota of the business—there being a pretty good volume of business passing in the local market during the past few days in particular. Kraft papers, also, are showing up well—the business being in proportion to the general trend, with the mills, as usual, some weeks behind. While boards have not been over active during the past week or so, the situation is very strong and an early advance in prices would not be at all surprising. News is inclined to be quiet, but prices are

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on a more stable basis than they have been for some months past. Manufacturers in most cases report that they have oversold their output, and many of them have withdrawn from the market. This naturally lends a stronger tone. Quotations throughout the paper list are without a change and are repeated as follows:

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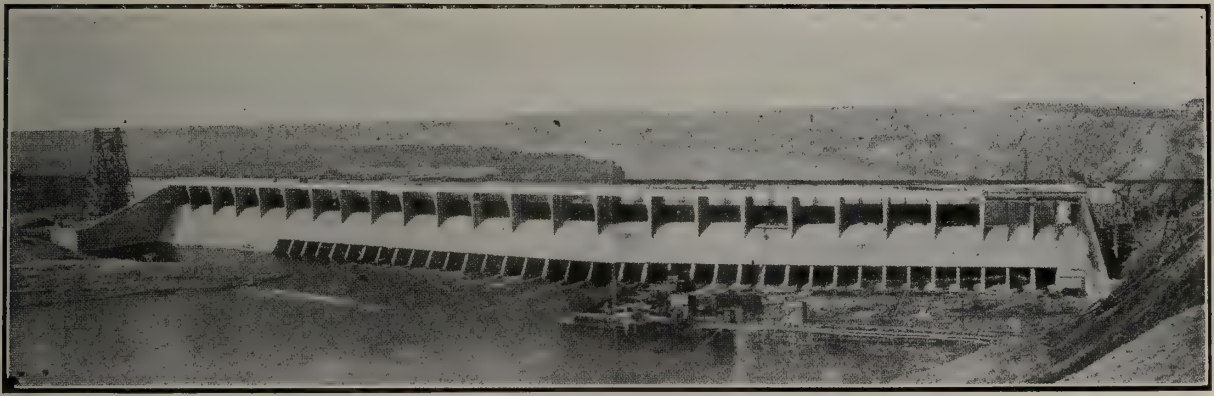

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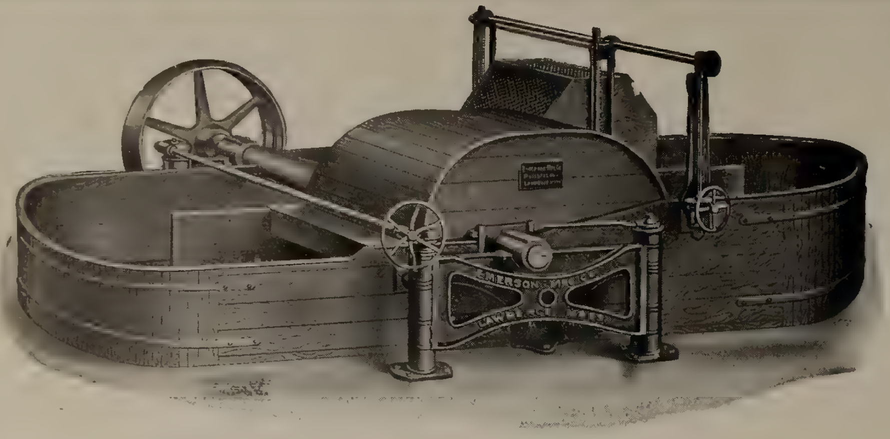

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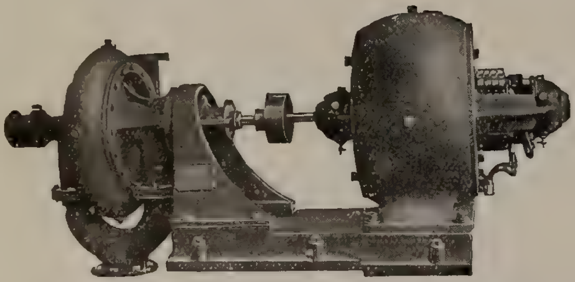

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Stebbins Eng. & Mfg. Co., Watertown, N.Y.
Ticonderoga Machine Works, Ticonderoga, N.Y.
Valley Iron Works, Appleton, Wis.
Voith, J. M., New York, N.Y.
Voith, J. M., Wurtemberg, Germany.
Walmsley, Chas. & Co., Bury, Eng.
Waterous Engine Works Co., Ltd., Brantford, Can.
Westbye, P. P., Peterboro, Can.
West End Engine Works Co., Edinburgh, Scotland.

Paper Machine Tachomoters
Boving & Co., of Canada, Limited, Toronto, Ont.
Schaeffer & Budenberg, Brooklyn, N.Y.

Paper Tester
Chambers Ltd., 152 Bay Street, Toronto.
Marshall, T. J. & Co., Stoke Newington, London, England.

Pneumatic Thickeners
Sherbrooke Mach. Co., Ltd , Sherbrooke, Que.

Pneumatic Chain Blocks
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Press Rolls
Bertrams Ltd., Edinburgh, Scotland.
Chambers Ltd., 152 Bay Street, Toronto.
Sherbroke Mach. Co Ltd , Sherbroke, Que.

Press Wire Cloth.
Chambers Ltd., 152 Bay Street, Toronto.
Kufferath, Andreas, Mariaweiler, Germany.

Pulp Stones
Stancliffe Estates Co., Ltd., Darley Dale, England.

Pumps
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Machine Co., Lawrence, Mass.
Glen Falls Machine Works, Glens Falls, N.Y.
Hamilton, Wm., Co., Peterboro, Can.
Lawrence Machine Co., Lawrence, Mass.
Lawrence Pump & Engine Co., Lawrence. Mass.
Smart-Turner Machine Co., Hamilton, Can.
Sherbrooke Mach. Co., Ltd , Sherbrooke, Que.
Voith, J. M., New York, N.Y.

Rags
Walker, J. R. & Co., Montreal, Can.

Recording Gauges
Schaeffer & Budenberg, Brooklyn, N.Y.

Recording Thermometers
Schaeffer & Budenberg, Brooklyn, N.Y

Refiners
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Marx, J. & Co., London, E.C., England.
Process Engineers, Ltd., Montreal, Canada.
Rice, Barton & Falls Mach. & Iron Co., Worcester, Mass.
Voith, J. M., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford, Can.

Rope Blocks
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Rosin Size
Fox, Stockell & Co., London, Eng.
Paper Makers Chemical Co., Easton, Pa.
Process Engineers, Ltd., Montreal, Canada.
Vera Chemical Co., North Milwaukee, Wis.
Wilson-Paterson Co., Board of Trade Bldg., Montreal, Can.

Rosin Size Boilers and Dissolvers
Boving & Co., of Canada, Limited, Toronto, Ont.

Rotary Sulphur Furnaces
Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Pulp Mill Machinery Co., Montreal, Can.
Stebbins Engineering and Manufacturing Co., Watertown, N Y.

Runways—Hand operated
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Save-Alls
Boving & Co., of Canada, Limited, Toronto, Ont.
Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
Waterous Engine Works Co., Ltd., Brantford, Can.

Self Landing, Self Delivery Hoists
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Screen Plates
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.

Screens
Bertrams Ltd., Edinburgh. Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street. Toronto.
Glens Falls Mach. Wks., Glens Falls, N Y
Harmon Machine Co., Watertown, N.Y.
Jenckes Machine Co., Sherbrooke, Can.
Johnson, Chas., St. Henry, Que.
Marx & Co., J., London, England.
Process Engineers, Ltd., Montreal, Canada.
Sherbrooke Mach. Co. Ltd. Sherbrooke, Que
Tippet Arthur P. & Co., Montreal, Cau.
Voith, J. M., New York, N.Y.
Voith, J. M., Wurtemberg, Germany.
Waterous Engine Works Co. Ltd., Brantford, Can
Westbye, P. P., Peterboro, Can

Shear Legs
Morris, Herbert, Hoist & Crane Co., Toronto, Ont.

Slings
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Slitters and Re-Winders
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Moore & White Co., Philadelphia, Pa.
Ticonderoga Machine Works, Ticonderoga, N.Y.

Smelting Furnaces
Boving & Co., of Canada, Limited, Toronto, Ont

Straw Cutters'
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.

Straw Dusters
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.

Straw Digesters
Boving & Co., of Canada, Limited, Toronto, Ont.

Strawboard Making Machines
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.

Steam Regulator
Pickles, W. F., Buckland, Conn.

Stuff Chests
Boving & Co., of Canada, Limited, Toronto, Ont.

Sulphite Mill Equipment
Boving & Co., of Canada, Limited, Toronto, Ont.
Stebbins Engineeringand Manufacturing Co., Watertown, N.Y

Sulphate Mill Equipment
Boving & Co., of Canada, Limited, Toronto, Ont.

Sulphur
Union Sulphur Co., 17 Battery Place, New York, N.Y.

Sulphur Burners
Boving & Co., of Canada, Limited, Toronto, Ont.
Glens Falls Machine Works, Glens Falls, N.Y.
Stebbins Engineering and Manufacturing Co. Watertown, N.Y.

Tachometers (Hand and Stationary)
Boving & Co., of Canada, Limited,Toronto, Ont.
Schaeffer & Budenberg, Brooklyn, N Y.

Track Systems
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Tanks
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Boving & Co., of Canada, Limited, Toronto, Ont.
Hamilton, Wm., Co., Peterboro, Can.
Jenckes Machine Co , Sherbrooke, Can.
McDougall, John, Caledonian Iron Works, Montreal, Can.

Thermometers
Schaeffer & Budenberg, Brooklyn, N.Y.

Transmission Machinery
Caldwell, H. W. & Son Co., Chicago, Ill.
Canadian Allis-Chalmers, Limited, Toronto.
Boving & Co., of Canada, Limited, Toronto
Jones & Glassco, Montreal, Can.
Dodge Manufacturing Co., Montreal, Can.

Traveling Cranes
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Trolleys
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

MILL SUPPLIES---Continued

Turbines

Boving & Co., of Canada, Toronto, Ont.
Canadian Allis Chalmers, Ltd., Toronto, Ont.
Jenckes Machine Co., Ltd., Sherbrooke, Can.
Smith, S. Morgan Co., York, Pa.
Voith, J. M. Co., Inc. New York, N.Y.
Voith, J. M., Wurtemberg, Germany.

Water Wheels

Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Allis Chalmers, Ltd., Toronto, Ont.
Hamilton, Wm. Co., Ltd., Peterboro, Can.
Jenckes Machine Co., Sherbrooke, Can.
Smith, S. Morgan Co., York, Pa.
Voith, J. M., New York, N.Y.

Wire Cloth for Paper Machines

Chambers, Ltd., Toronto.
Christie, Geo., Ltd., Glasgow, Scotland.
Johnson, C. H. & Sons, Ltd., St. Henry, Montreal, Que
Kufferath, Andreas, Mariaweiler, Germany.
Tippet, Arthur P. & Co., Montreal, Can.
Taylor, J. A., Montreal, Can.
United Wire Works, Ltd., Edinburgh, Scotland.
Westbye, P. P., Peterboro, Can.

Waste

Hough, R., London, England.

Wet Machines

Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Glens Falls Machine Works, Glens Falls, N.Y.
Hamilton, Wm. Co., Peterboro, Can.
Jenckes Machine Co., Sherbrooke, Can.
Process Engineers, Ltd., Montreal, Canada.
Sherbrooke Machinery Co., Sherbrooke, Can.
Voith, J. M., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford Ont.

PULP AND PAPER MILL PRODUCTS

This aims to be a complete list of the products of Canadian Pulp and Paper Mills, who are urged to send us lists of brands and watermarks, as well as the headings under which they wish to be indexed. Buyers who cannot meet their requirements from this list, are invited to communicate with the editor, who is in close touch with the mills, and will gladly furnish full information.

PULP MILLS

Ground Wood Pulp

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
Basin Electric Light & Power Co., Ltd., Montmagny, Que.
Beaver Co. Ltd., Thorold, Ont.
Belgo-Canadian Pulp & Paper Co., Shawinigan Falls, Que.
Brompton Pulp & Paper Co., Brompton and E. Angus, Que.
Booth, J. R. Ottawa, Ont.
Bronson Co., Ltd., Ottawa, Ont.
Clyde River Pulp & Paper Co., Ltd., Liverpool, N.S.
Colonial Wood Products Co., Ltd., Thorold, Ont.
Campbell Lumber Co., Weymouth, N.S.
Canada Paper Co., Ltd., Montreal, Que.
Chicoutimi Pulp Co., Chicoutimi, Que.
Compagnie de Pulpe de Dalmas, Dalmas, Que.
Davy, James, Thorold, Ont.
Eddy Co., The E. B., Ltd., Hull, Que.
East Canada Power & Pulp Co., Ltd., Nairn Falls, Que.
Foley-Rieger Pulp & Paper Co., Ltd., Thorold, Ont.
Ford, J. & Co., Port Neuf, Que.
Jacques-Cartier Pulp & Paper Co., Montreal.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
La Cie de Metabetchouan, St. Andre, Que.
La Havre Pulp Co., Ltd., Bridgewater, N.S.
Lake Megantic Pulp Co., Lake Megantic, Que.
Laurentide Co., Ltd., Grand Mere, Que.
MacLaren Co., Ltd., The James, Buckingham, Que.
McLeod Pulp Co., Ltd., Liverpool, N.S.
News Pulp & Paper Co., Ltd., St. Raymond, Que.
Nicolet Falls Pulp & Lumber Co., Nicolet Falls, Que.
North Shore Power, Railway & Navigation Co., Clarke City.
Northumberland Paper & Electric Co., Campbellford, Ont.
Nova Scotia Wood & Pulp Co., Ltd., Mill Village, N.S.
Ontario Paper Company, Thorold, Ont.
Ouiatchouan Falls Paper Co., Ouiatchouan Falls, Que.
Powell River Co., Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que.
Price-Porritt Pulp & Paper Co., Rimouski, Que.
Reed, A. E. & Co., (Nfld.), Ltd., Bishop's Falls, Nfld.
River-du-Loup Pulp Co., Ltd., Fraserville, Que.
Soucy, F. Florentine, Old Lake Road, Que.
Spanish River Pulp and Paper Mills, Ltd., Espanola, Ont., Sturgeon Falls, Ont., Toronto, Ont., and Sault Ste. Marie, Ont.
St. George Pulp and Paper Co., St. George, N.B.
Thorold Pulp Co., Ltd., Thorold, Ont.
Trent River Paper Co., Ltd., Frankford, Ont.
Union Bag & Paper Co., Cape Madeleine, Que.
Trent Valley Paper Mills, Glenmiller, Ont.
Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Q

Kraft

Brompton Pulp & Paper Co., East Angus, Que.
Dryden Timber and Power Co., Dryden, Ont.
New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
Quebec and St. Maurice Industrial Co., La Tuque, Que.
Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que

Soda Fibre

Canada Paper Co., Ltd., Montreal and Toronto.
Dominion Paper Co., Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.

Sulphite Fibre

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
Booth, J. R., Ottawa, Ont.
Dominion Pulp Co., Ltd., Chatham, N.B.
Edward Partington Pulp & Paper Co., Ltd., St. John, N.B.
Eddy Co., The E. B., Ltd., Hull, Que.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Lake Superior Paper Co., Ltd., Sault Ste. Marie, Ont.
Powell River Co., Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que.
Riordan Pulp & Paper Co., Ltd., Montreal, Que.
Spanish River Pulp and Paper Mills Ltd., Sturgeon Falls, Ont., and Sault Ste. Marie, Ont.
Swanson Bay Forests, Wood, Pulp & Lumber Mills, Ltd., Swanson, Bay, B.C.
Toronto Paper Mfg. Co., Ltd., Cornwall, Ont.

PAPER MILLS

Bag

Eddy, The E. B. Co., Ltd., Hull, P. Q.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
Ford, J. & Co., Port Neuf.
Wilson, Ltd., J. C., 61 St. Alexander Street, Montreal, Que.
Jonquiere Pulp Co., Jonquiere, Que.

Binders' Board

McArthur, Alex. & Co., Montreal.
Northumberland Paper and Electric Co., Campbellford, Ont.

Blotting

Canada Paper Co., Montreal, Que., "Velvet Blotting."

Board

See Wood Board and Cardboard Specials.

Bond

Canada Paper Co., Ltd., Montreal, Que. "Burmese Bond," "St. Lawrence Bond," "Canada Bond," "Burmese Linen Ledger," "Windsor Mills Special," "Silverstream," "Springvale," "Super Writing," "White Railway," "Railway Manilla."
Howard Smith Paper Mills, Ltd., Montreal & Beauharnois, Que.
Kinleith Paper Co., Ltd., St. Catharines, Ont.
Rolland Paper Co., St. Jerome, Que., Mount Rolland, Que. and Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Book and Litho

Canada Paper Co., Ltd., Montreal, Que. "Art Photo Book," "Tinted Art Book," "Art Chromo," "English Book," "Satin Book," "Satin Litho," "Litho Label," "Super S. C. Book," "Standard S. C. Book," "Windsor Book."
Eddy Co., The E. B. ,Ltd., Hull, Que.
Kinleith Paper Co., Ltd., St. Catharines, Ont.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Box Board

See Wood Board and Cardboard Special .

Dominion Timber Regulations

Licenses to cut timber on Dominion Lands in the Provinces of Manitoba, Saskatchewan, and Alberta, the Northwest Territories, within twenty miles on either side of the main line of the Canadian Pacific Railway in the Province of British Columbia, and in the tract of three and one-half million acres to be located by the Government of the Dominion in the Peace River district in the Province of British Columbia, lying east of the Rocky Mountains and adjoining the Province of Alberta, shall be disposed of by public auction at the office of the Dominion Timber Agent for the district in which the berths are situated.

Before any parcel of timber is offered for sale it shall be surveyed by a duly qualified Dominion Land Surveyor into berths of an area not exceeding twenty-five square miles, and each of such berths shall then be thoroughly cruised by a duly qualified timber cruiser in the employ of the Dominion Government. The Minister shall then fix an upset price at which the berth shall be disposed of, and no berth shall be sold at less than the price so fixed.

Purchases to the amount of one thousand dollars or under shall be paid in cash at the time of sale. Purchases over one thousand dollars and not exceeding five thousand dollars shall be paid, one-half in cash at the time of sale, and a note or notes shall be given for the remaining half of the purchase price, payable in three months, with interest at the rate of five per cent. per annum. Purchases over five thousand dollars and not exceeding ten thousand dollars shall be paid one-third in cash at the time of sale, and notes shall be given for the remaining two-thirds of the purchase price, payable in three and six months, with interest at the rate of five per cent. per annum. Purchases exceeding ten thousand dollars shall be paid one-fourth in cash at the time of sale, and notes shall be given for the remaining three-fourths of the purchase price, payable in three, six and nine months, with interest at the rate of five per cent. per annum. Notes shall be made payable at a bank in the city or town in which the sale is held or at a bank in the city of Ottawa. Cash payments must be made at the time of sale in legal tender or by an accepted cheque on a chartered bank, or by a draft issued by a chartered bank, payable to the order of the Deputy Minister of the Interior. If default is made in any payment required by this section the sale shall be forfeited and void.

The purchaser must also pay the cost or the estimated cost of the survey of the berth before a license is issued.

The licensee shall pay an annual ground rent of five dollars per square mile except for lands situated to the west of Yale, in the Province of British Columbia, in which case the yearly ground rent shall be five cents per acre.

The licensee shall pay the following dues on timber cut on his berth:—

Sawn lumber, 50 cents per thousand feet, board measure.

Railway ties, eight feet long, 1½ cents each.

Railway ties, nine feet long, 1¾ cents each.

Shingle bolts, 25 cents per cord.

And 5 per cent. on the sale of all other products of the berth.

Timber Permits

Yearly permits are granted to settlers, mine operators and others on application to the Dominion Timber Agents, from whom further information can be obtained.

W. W. Cory,
Deputy Minister.

Department of the Interior, Ottawa,
December 20th, 1912.

PAPER MILLS---Continued

Bristol

Don Valley Paper Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.
Canada Paper Co., Montreal & Toronto, "King Bristol," "Windsor Bristol," "C. P. S.Tinted Bristol," "Canada Bristol."

Building and Sheathing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que.
British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
Eastern Paper Co., Ltd., St. Basile, Que.
Montreal Paper Co., St. Basil, Que.
Northumberland Paper and Electric Co., Ltd., Montreal.
Riordon Pulp and Paper Co., Ltd., Montreal, Que.
Western Paper Mills, Ltd., Vancouver, B.C.
Jonquiere Pulp Co. Ltd., Jonquiere, Que.
Ford, R. & Son, Port Neuf, Que.
Laurentide Co., Ltd., Grand Mere, Que.
McArthur, Alex. & Co., Montreal, Que.
McLeod Pulp Co., Ltd., Liverpool, N.S.
Walker, J. R. & Co., Montreal, Que.

Cardboard Specials

Hinde & Dauche Paper Co., Ltd., Toronto, Ont.
Jonquiere Pulp Co., Jonquiere, Que.
Macleod Pulp Co., Ltd., Liverpool, N.S.
Canada Paper Co., Windsor Mills, Que. "Victor Printers' Blanks," "Superior Translucent Bristol," " C.P.C. Coated Litho," "Superfine Litho Blanks."
Booth, J. R., Ottawa, Ont.
Eddy, E. B. Co., Ltd., Hull, Que.
Laurentide Co. Ltd., Canada Life Building, Montreal, Que.

Carpet Lining

Ford, J. & Co., Port Neuf Station, Que.
Montreal Paper Co., St. Basile, Que.
Northumberland Paper & Electric Co., Ltd., Campbellford, Ont.
Wentworth Paper Mills, West Flamboro, Ont.
Western Paper Mills. Ltd., Vancouver, B.C.

Coated

Ritchie & Ramsay, Toronto, Ont.
Georgetown Coating Mills, Ltd., Georgetown, Ont.
National Paper Co., Valleyfield, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.

Corrugated Paper

Lazier Paper Mills, Ltd., Belleville,
Hinde & Dauche Paper Co., Ltd., Toronto, Ont.

Cover

Canada Paper Co., Ltd., Montreal and Toronto, "Tinted Art Cover," "Derby Cover," "Fibrestoc Cover," "Cashmere Cover," "X Cover," "XX Cover."
Eddy Co., The E. B. Ltd., Hull, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Ritchie & Ramsay, Toronto, Ont.

Envelope

Don Valley Paper Co., Ltd., Toronto.
Kinleith Paper Co., Ltd, St. Catherines, Ont.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Felts

Bird, F. W. & Sons, Hamilton, Ont., and Pont Rouge, Que.
Eastern Paper Co., Ltd., St. Basile, Que
McArthur, A. & Co., Montreal, Que.
Ford, J. & Co., Port Neuf, Que.
Ford, R. & Son, Port Neuf Station, Que.
Montreal Paper Co., St. Basile, Que.
Northumberland Paper & Electric Co., Ltd., Campbellford.
Western Paper Mills, Ltd., Vancouver, B.C.

Fibre

Canada Paper Co., Ltd., Montreal and Toronto.
Dominion Paper Co., Montreal, Que.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
McArthur, Alex. & Co., Montreal, Que.
Riordon Pulp and Paper Co., Merritton, Ont.
Strathcona Paper Co., Strathcona, Ont.
Wilson, Ltd., J. C., Montreal, Que.

Flour Sacks

Eddy Co., The E. B., Ltd., Hull, Que.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal.

Glazed

Provincial Paper Mills Co., Ltd., Toronto, Ont.

Hanging

Lincoln Paper Mills Co., Ltd., Merritton, Ont.
McArthur, Alex. & Co., Montreal, Que.
Moira Paper Mills, Belleville, Ont.
Riordon Pulp and Paper Co., Ltd., Montreal, Que.
Strathcona Paper Co., Strathcona, Ont.

Kraft

Brompton Pulp & Paper Co. Ltd., East Angus, Que.
Dominion Paper Co. Ltd., Montreal, Que.
Dryden Timber and Power Co. Ltd., Dryden, Ont.
New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que.

Leather Friction Board

Walker, J. R. & Co., Montreal, Que.

News

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
Belgo-Canadian Pulp and Paper Co., Shawinigan Falls, Que.
Booth, J. R., Ottawa, Ont.
Canada Paper Co., Ltd., Montreal and Toronto, "Canada Brand."
Eddy Co., The E. B., Ltd., Hull, Que.
Ford, Joseph & Co., Port Neuf, Que.
Fort Frances Pulp & Paper Co., Ltd., Fort Frances, Ont.
Jonquiere Pulp Co., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Lake Superior Paper Co., Sault Ste. Marie, Ont.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
McArthur, Alex. & Co., Montreal, Que.
Miller Bros. Co., Ltd., Glenmiller, Oht.
News Pulp & Paper Co., Ltd., St. Raymond, Que.
Powell River Co. Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que.
Riordon Pulp and Paper Co., Ltd., Montreal, Que
Spanish River Pulp & Paper Mills, Ltd., Toronto, Ont.
Ontario Paper Co., Thorold, Ont.

Roofing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que.
Ford, Joseph & Co., Port Neuf, Que.
Ford, Rowland and Son, Port Neuf, Que.
Montreal Paper Co., St. Bazile, Que.
Walker, J. R. & Co., 35 Common, Montreal, Que.
Western Paper Mills, Ltd., Vancouver, B.C.

Straw Board

Ford, J. & Co., Port Neuf, Que.
Lazier Paper Mills, Ltd., Belleville.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
McArthur, A. & Co., Montreal, Que.
Moira Paper Mills, Belleville, Ont.
Northumberland Paper & Electric Co., Campbellford, Ont.
Trent River Paper Co., Ltd., Frankford, Ont.
Trent Valley Paper Mills, Glenmiller, Ont.

Tag

Don Valley Paper Co., Ltd., Toronto, Ont.
Eddy, The E. B. Co., Ltd., Hull, Que.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
J. R. Booth, Ottawa, Ont.

Tissue and Toilet

Eddy Co., The E. B., Ltd., Hull, Que.
Garden City Paper Mills, Ltd., St. Catharines, Ont.
Interlake Tissue Mills, Ltd., Merritton, Ont.
Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Que

Wall Board

Beaver Co., Ltd., Beaverdale, Que.
Bishoprick Wallboard Co., Ottawa, Ont.

Wood Board

Beaver Co. Ltd., Thorold, Ont.
Booth, J. R. Ottawa.
Brompton Pulps Paper Co. Ltd., East Angus, Que.
Canada Paper Co., Montreal, Que.
Eddy Co., The E. B., Ltd., Hull, Que.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Northumberland Paper & Electric Co., Campbellford, On.
McLeod Pulp Co., Liverpool, N.S.
Western Paper Mills, Ltd., Vancouver, B.C.
Wilson, J. C., Ltd., 61 St. Alexander St., Montreal Que

Wrapping

Booth, J. R., Ottawa, Ont.
Canada Paper Co., Ltd., Montreal and Toronto, "Scotch Fibre," "Invictus Fibre," Hercules Manilla," "St. Fancis Manilla," "Wave Crest Drug."
Dominion Paper Co., Montreal, Que.
Don Valley Paper Co., Ltd., Toronto, Ont.
Eddy Co., The E. B., Ltd., Hull, Que.
Ford, J. & Co., Port Neuf, Que.
Ford, Rowland, Port Neuf, Que.
Gore Valley Paper Mills, Dundas, Ont.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Canada Paper Co., Monreal and Toronto.
See also Kraft.

Writing

Howard Smith Paper Mills Ltd., Beauharnois, Que.
Kinleith Paper Co., St. Catherines, Ont.
Rolland Paper Co., Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Manufacturing Co., Cornwall, Ont.

THE PROVINCE OF ONTARIO

is rich in timber, mineral, agricultural, and other resources.

Ontario has large areas of White Pine and other valuable timbers, her timber products last year representing one-third of the total output of Canada.

Ontario has pulpwood areas practically illimitable, and offers a great field for those desirous of embarking in the pulp and paper-making industry.

Ontario has innumerable waterfalls capable of supplying power for all manufacturing purposes, which are obtainable on reasonable terms, subject to development.

Ontario has large pulp and paper mills in operation at Ottawa, Sturgeon Falls, Spanish RiverSault Ste. Marie and Dryden and large plants are under construction at Abitibi on the Temiskaming and Northern Ontario Railway, and Fort Frances on the Rainy River.

Ontario is traversed East and West by three great transcontinental railways, and North and South by three others.

For full particulars as to Ontario's great resources and the advantages offered for large wood-using industries apply to

Hon. W. H. Hearst
Minister of Lands, Forests and Mines
Toronto

Paper Mill Agents and Commission Merchants

Calgary, Alta.

Davis, W. D. & Co., 3rd Street, W., and 7th Avenue.
John Martin Paper Co., Ltd.
Tees & Persse.

Edmonton, Alta.

Tees & Persse.
John Martin Paper Co., Ltd.

Saskatoon, Alta.

Tees & Persse.

Vancouver, B.C.

Brake, Creedon Co., Ltd.
Mitchell Bros., 123 Cordova E.
Smith, Davidson & Wright.

Victoria, B.C.

Mitchell Bros., 8 Bastion.

Moose Jaw, Sask.

Tees & Persse.

Regina, Sask.

Tees & Persse.

Winnipeg, Man.

Barber & Ellis
Clark Bros. & Co., Ltd., 143 Portage.
Ratcliffe Paper Co., Ltd.
Hudson Paper Co.
Kilgour Bros.
Martin, John, Paper Co., Ltd., 319 William.
McAllister & Watts.
McFarlane, Son & Hodgson, Bannatyne and Adelaide.
Tees & Persse.
John Martin Paper Co., Ltd.

St. John, N.B.

Schofield Paper Co., Ltd., 26-30 Prince William.

Moncton, N.B.

Reid, F. P. & Co.

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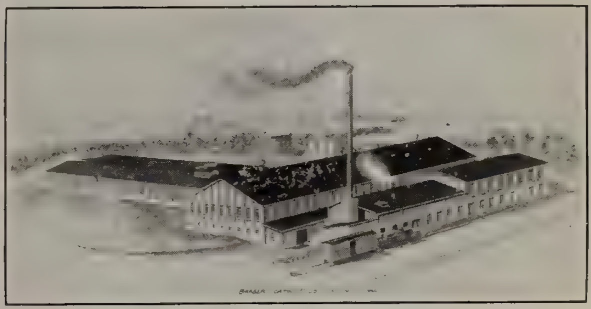

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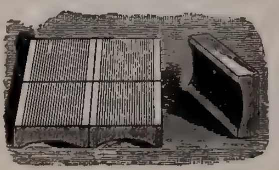

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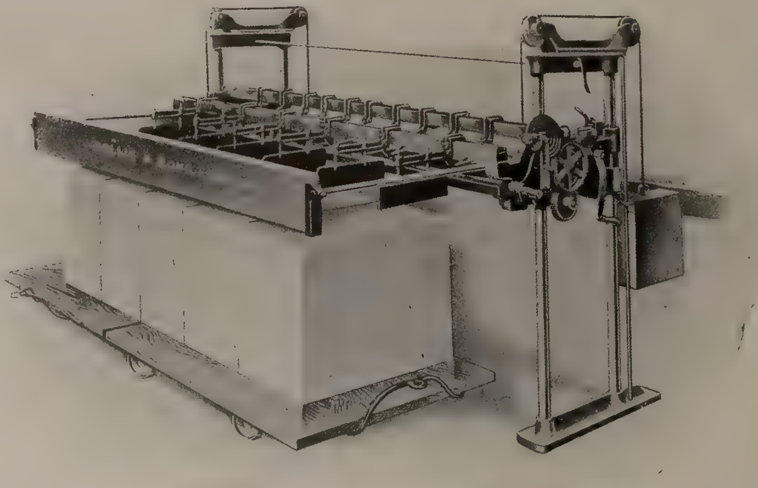

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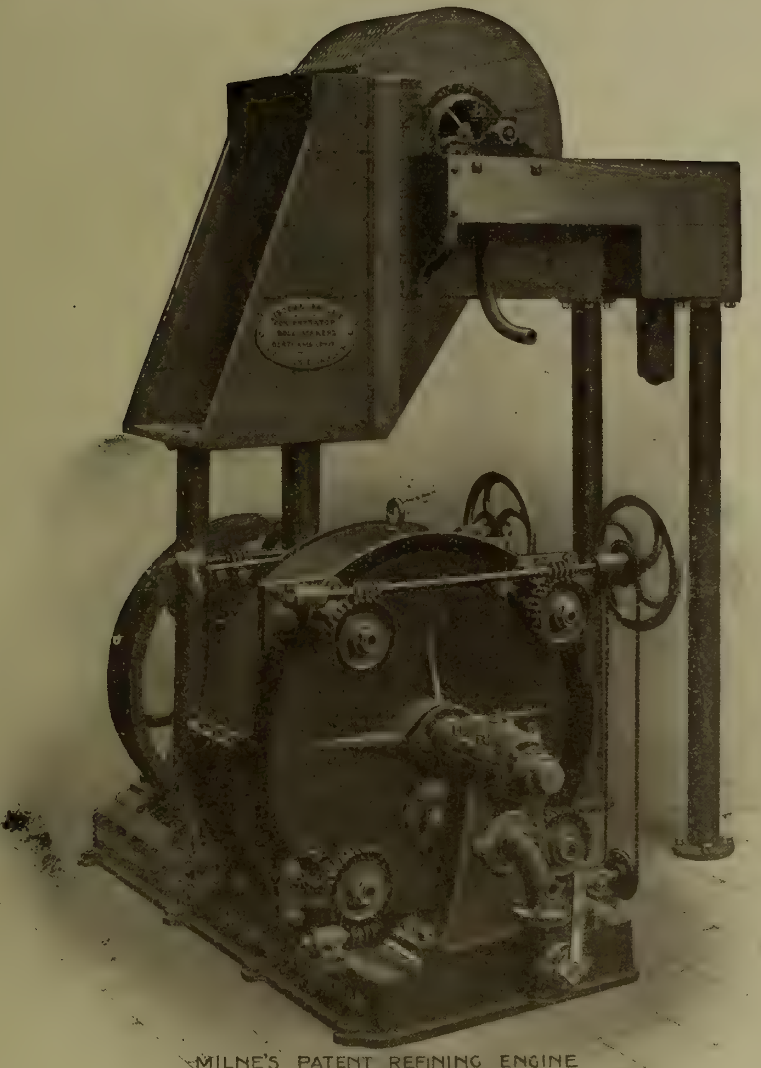

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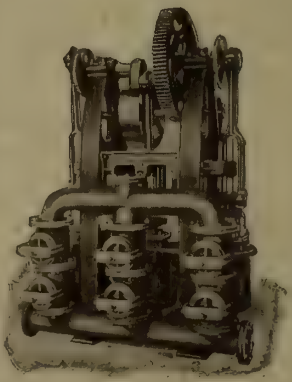

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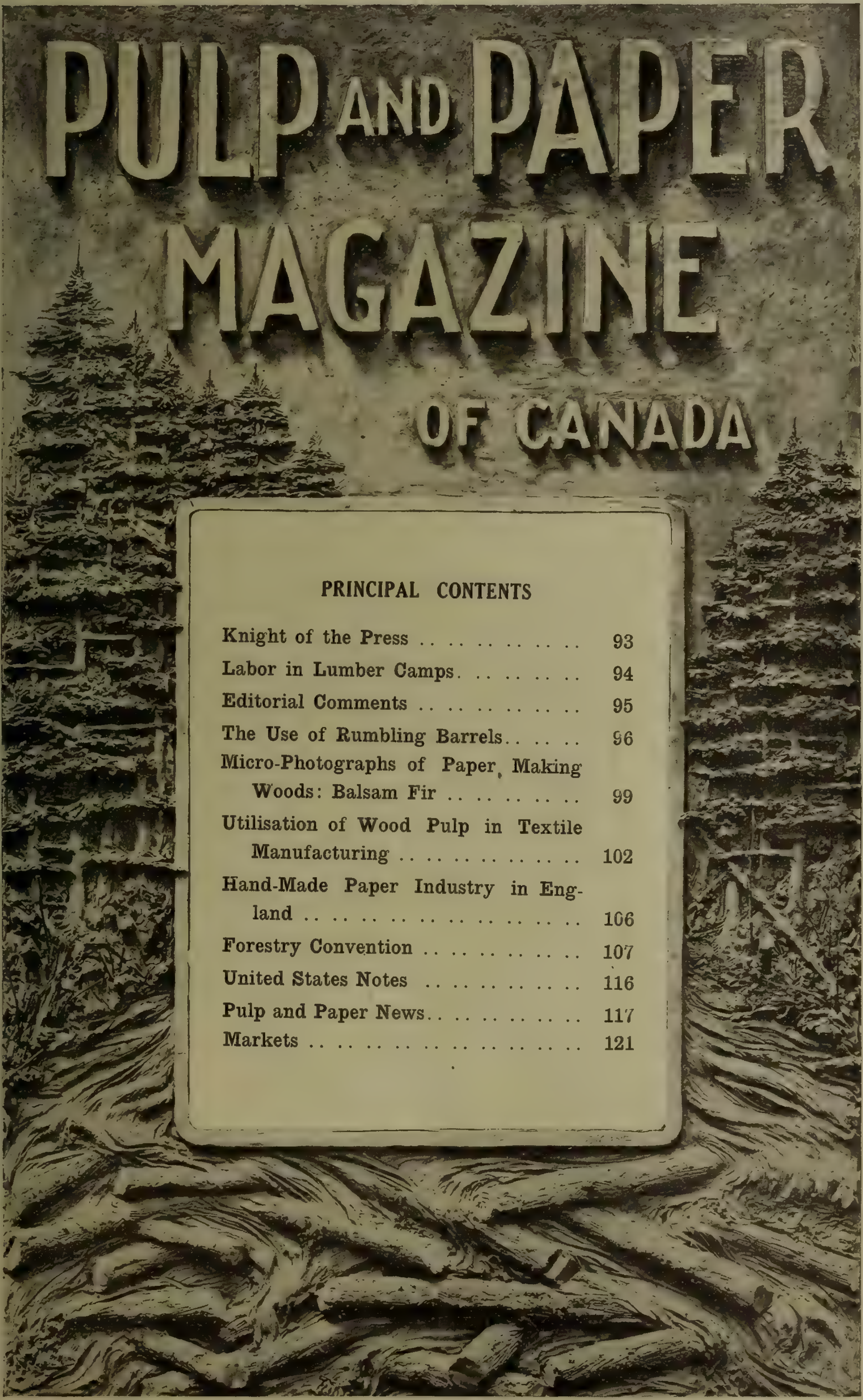
VOL. XII. MONTREAL, FEBRUARY 15, 1914 No. 4



PULP AND PAPER MAGAZINE OF CANADA

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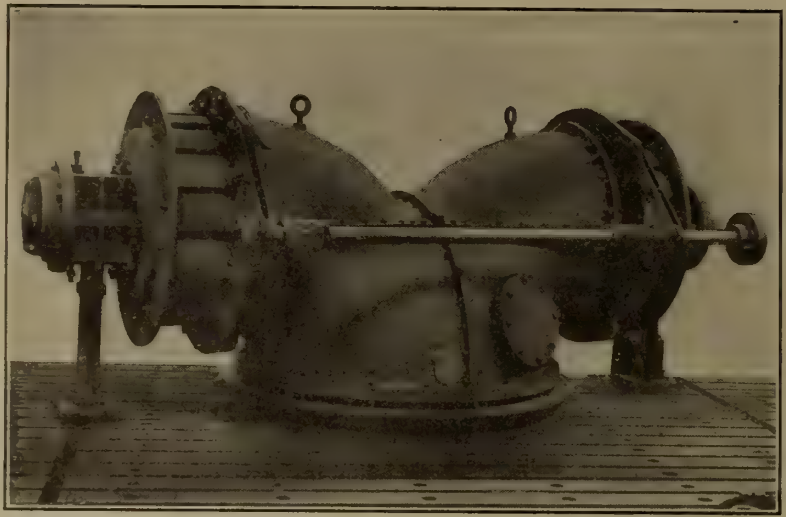
HYDRAULIC TURBINES



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New Paper Machine Drive

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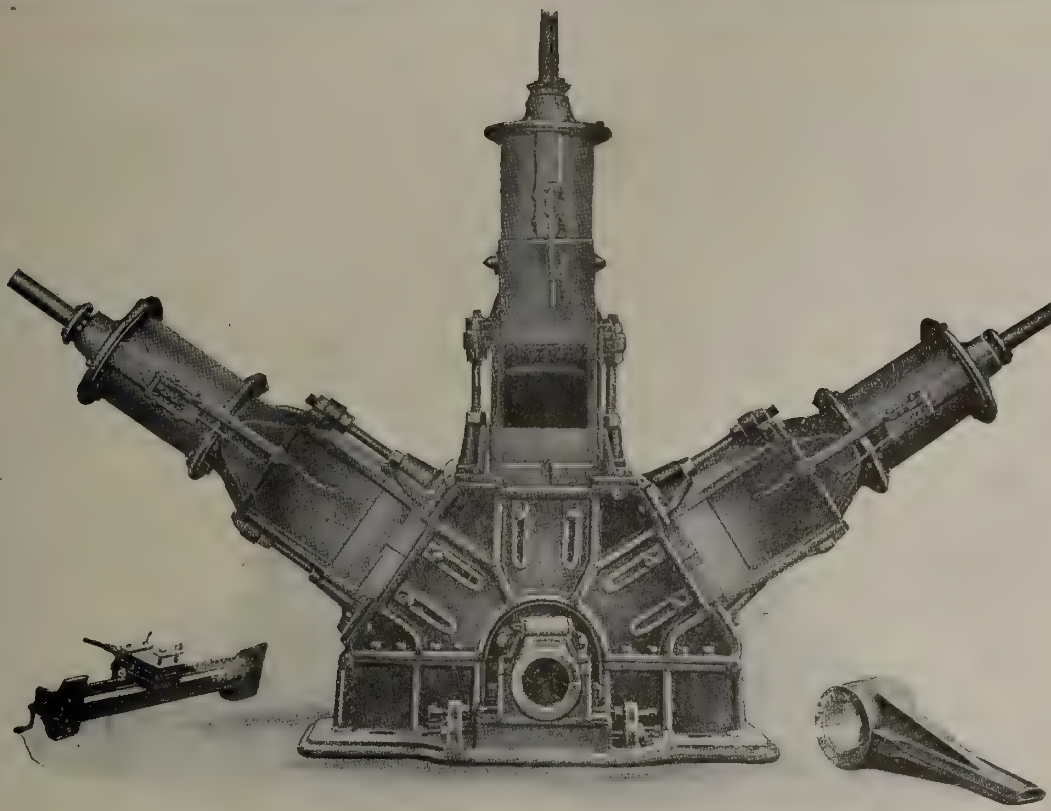

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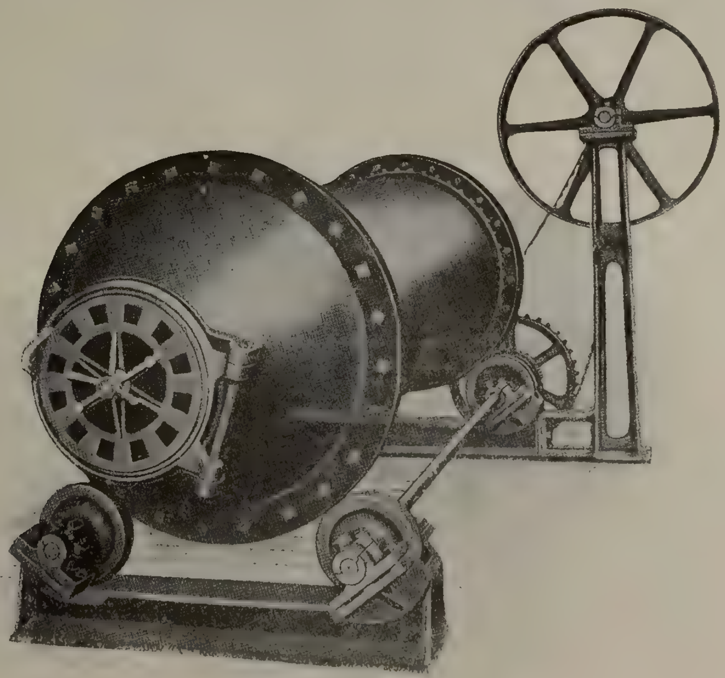

Rotary Sulphur Burner

Interior of the MACHINE ROOM of MESSRS. EDWARD LLOYD, LTD., SITTINGBOURNE, ENGLAND, containing the last two machines supplied to this Company by Chas. Walmsley & Co., Ltd.

CHARLES WALMSLEY & CO LTD BURY ENGLAND
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These "Walmsley" Fast News Machines are 175 inches wide, and are making paper at OVER 600 FEET PER MINUTE, with an OUTPUT OF 500 TONS NEWS PRINT WEEKLY. The machines are equipped with the Lloyd and Hutchison Patent Drive. This patent device is controlled by Walmsley & Co., Ltd., and dispenses entirely with Friction Clutches and Gear Wheels.

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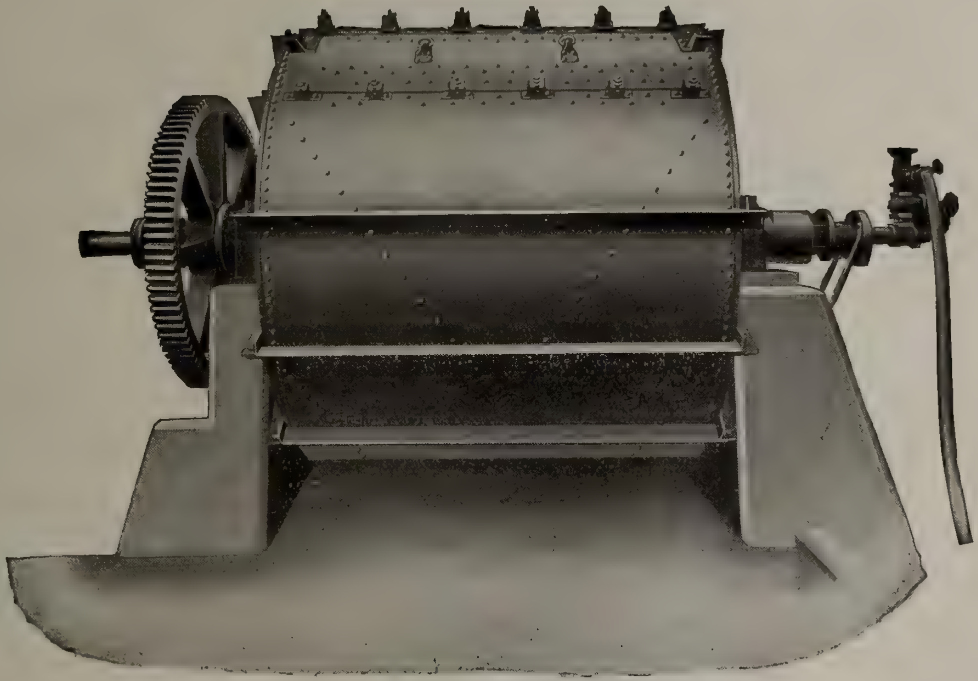
This Barking Drum affords the means of an immense saving in barking wood for pulp mill process



The BACH-WIIG Barking Drum

In this machine the bark is removed by the action of friction and water, therefore there is absolutely no loss of wood, shrinkage in cubic measurement being confined entirely to the percentage of bark. Tests made against the knife barker have shown the following results:

The Loss with the Barking Drum	
Round wood covered with bark	8%
Slabs	23.8%
Edgings	9.4%

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Loss with edgings on knife barker not given as it is well known they cannot be handled practically on knife barker, so really the savings on edgings is their comparative value for fire wood or for pulp wood

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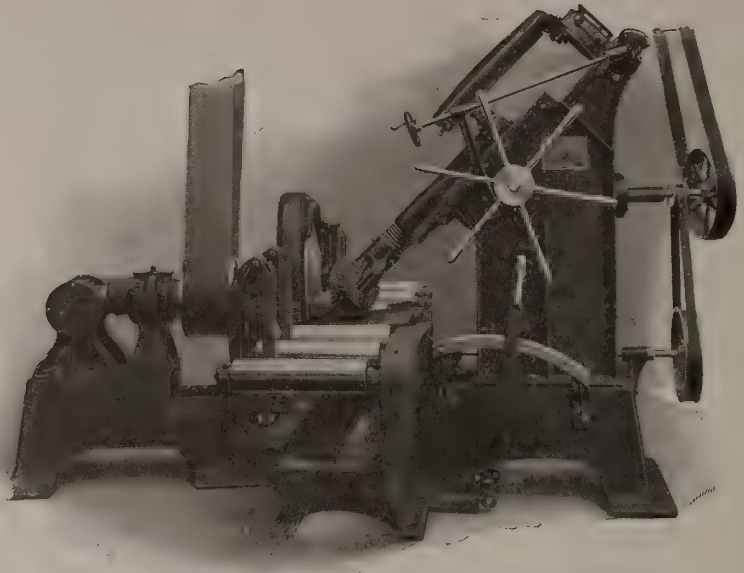

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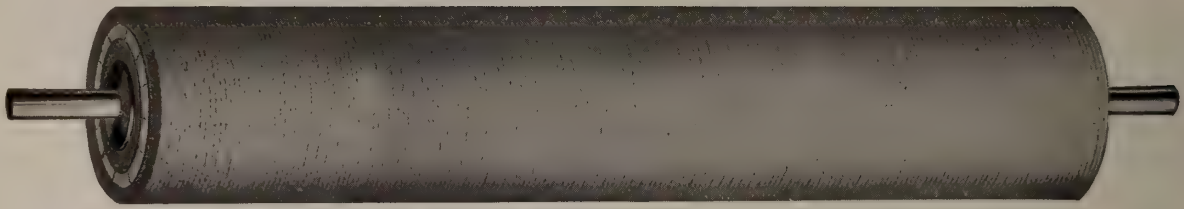

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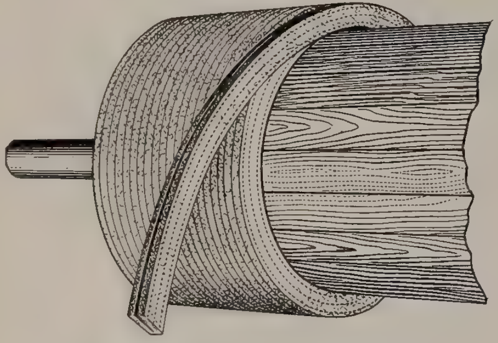
THEY KEEP ELASTIC
THEY ARE RIGHT IN PRINCIPLE AND MAKE GOOD IN PRACTICE



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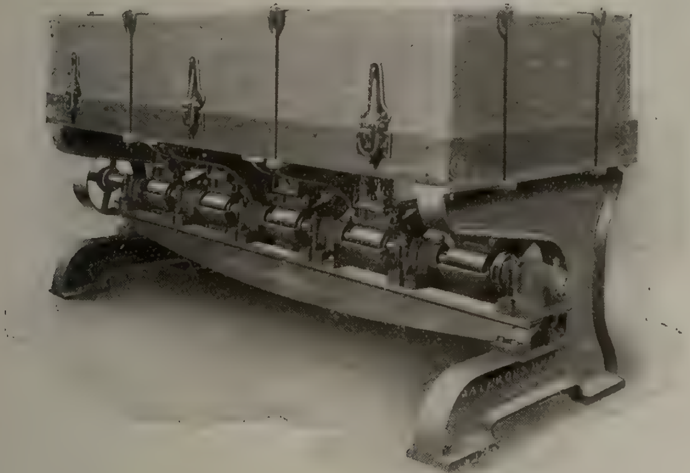

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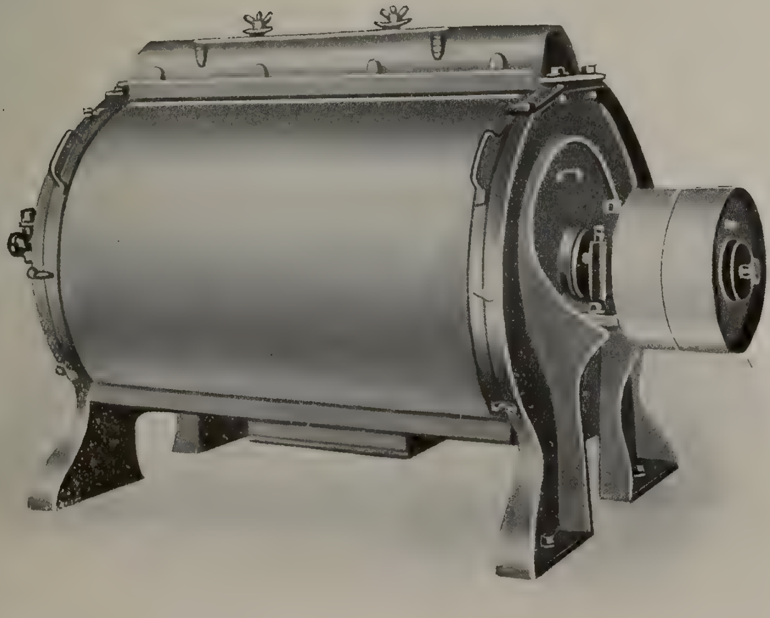

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x—Name on application

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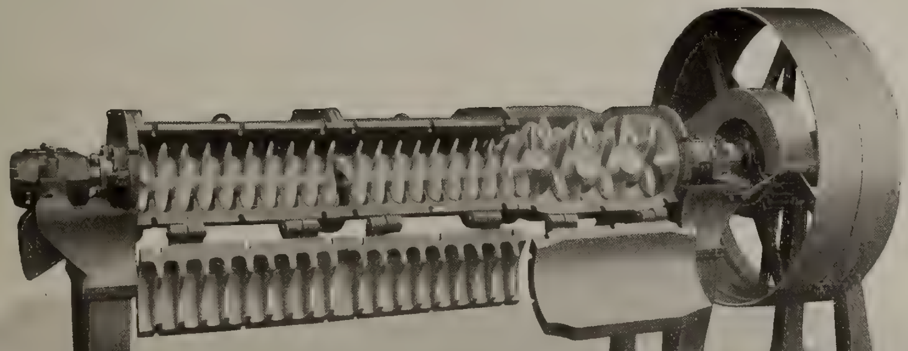

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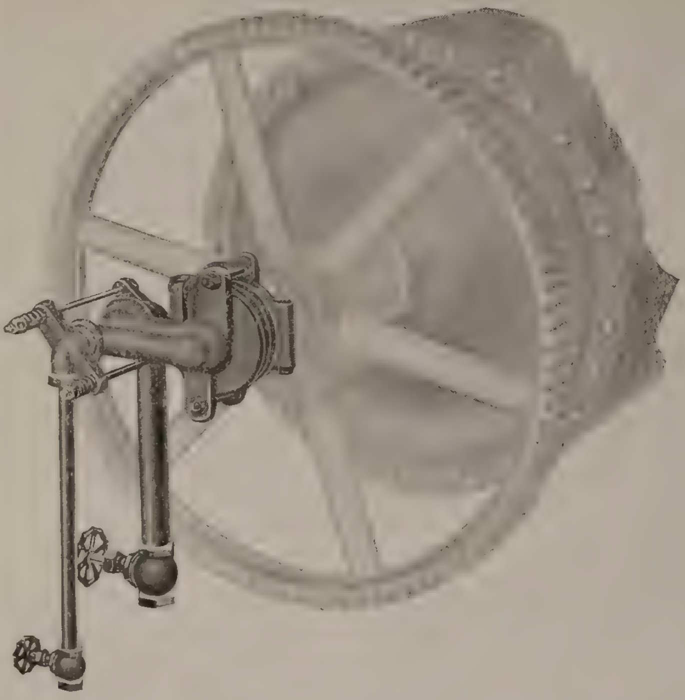

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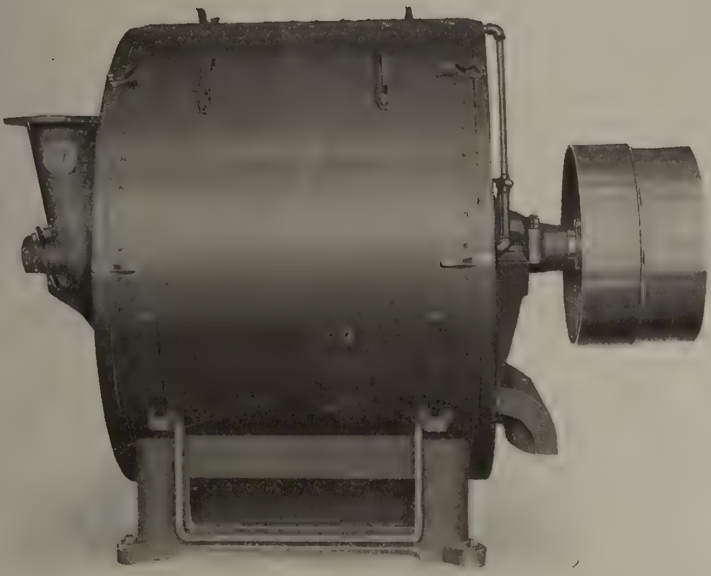

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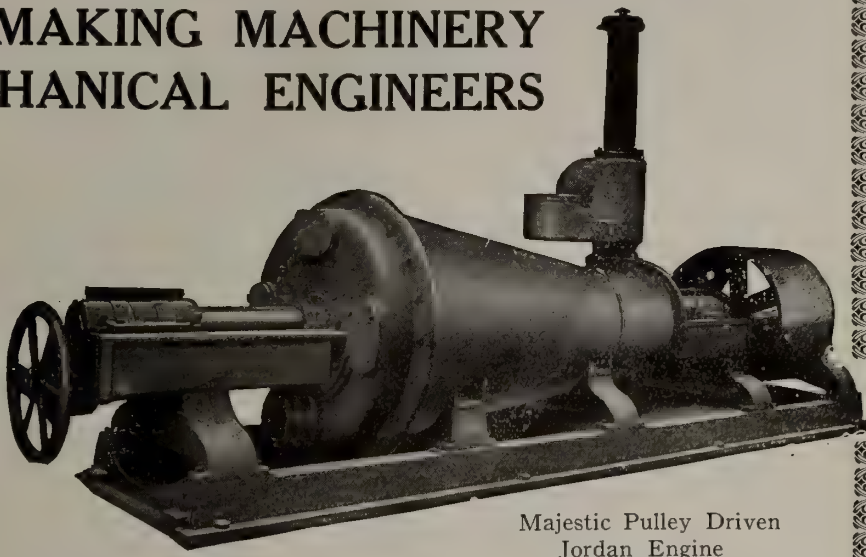

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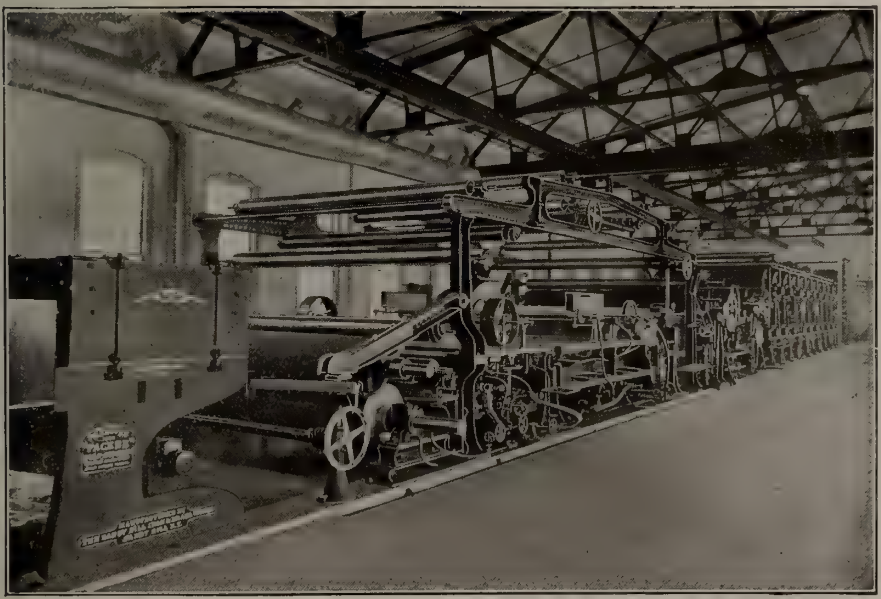

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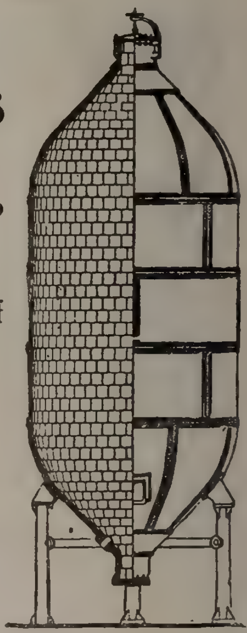

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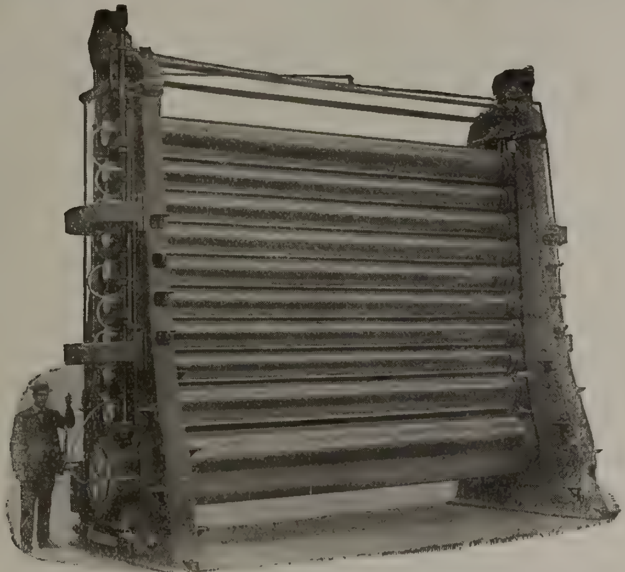

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Patent
Full Drum
Strainer

Full Particulars on Application.

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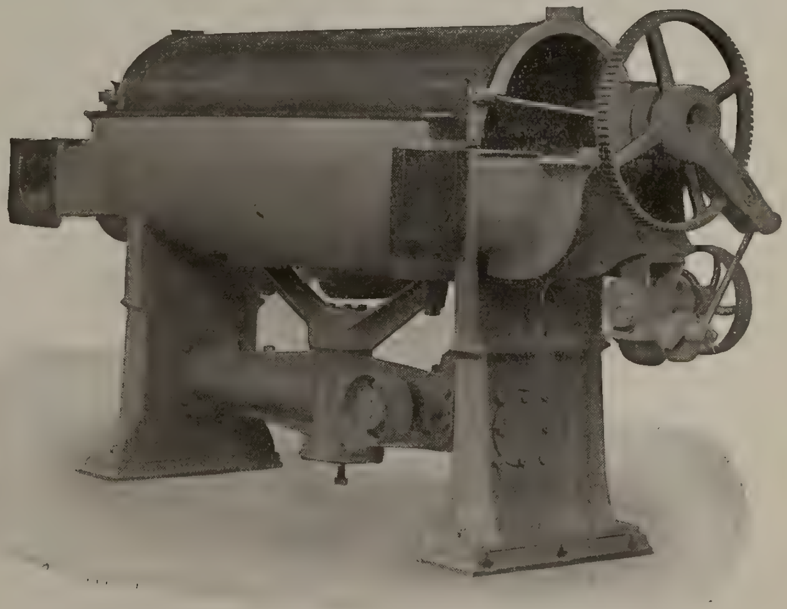

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Pulp and Paper Magazine
OF CANADA

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The Knight of the Press

Most interesting developments have come to light during the past few weeks in the Montreal newspaper situation, which have had a wide effect throughout the entire Eastern part of the Dominion.

The figure around which these revelations and discussions have centered has been, Sir Hugh Graham, proprietor of the Montreal Daily Star-Witness-Telegraph-Herald-et al. From the basement printer, with a few coppers, Sir Hugh Graham has developed a publishing business of enormous proportions—his largest paper, "The Montreal Star," is alone valued at two million dollars.

This phenomenal success has encouraged him to ape the roll of our famous friend, John Norris, of New York, formerly Chairman of the Committee on Paper of the American Newspaper Association.

It is a regrettable fact that the situation now made public, through the various "Graham" deals, has occurred in Canada. Up to the present time, publishers and other manufacturers have been doing business with each other on most equitable basis—each willing to concede to the other, a fair profit and reasonable consideration. This situation would never have been destroyed by the print manufacturers—all of whom have sold to Canadian consumers at a price less than obtained in the United States. They are giving the publishers of this country the benefit of the lower cost of production and raw materials, which our paper mills are enjoying temporarily—on the whole the publishers in this country have been treated most fairly and on a most business-like basis by the manufacturers of newsprint paper, but the success of Norris' methods at Washington, has led our ambitious Knight of Newspaperdom to stir up the quiet pool.

The amalgamation of a number of papers, either in one city, or in different parts of the country, is, of course, perfectly allright when carried on on the proper basis. A newspaper, as a moulder of public opinion, cannot, however, be manipulated entirely in the interests of high finance—there must come a day when people turn against such movements. A paper depending upon the public for support, as newspapers are, must not deal carelessly with this aspect of the situation.

Now, Sir Hugh Graham proposes to amalgamate the Purchasing Departments of a number of the largest Canadian Dailies (chiefly in those which he himself and the Southam people are interested) and to purchase all their paper from one mill in one large order, claiming by this means to save money to the papers. He also puts forth the argument that it would be to an advantage to do this by being able to use a standard width of roll, but it is well known that the presses of these various papers mentioned, are not uniform, and that after Sir Hugh Graham has closed his contract with a manufacturer, he will attempt to change the width of some of the rolls, and thus let the papermaker in for a large run of side runs, and in general, hand him the dirty end of the deal.

Sir Hugh's own statement of his reasons for interesting himself in so many papers of Montreal is as follows:—

> "Now as to the very natural question so often asked, why I am interested in other papers besides the Star:
>
> "Eleven years ago the certainty that a grave pulp and paper famine would eventually overtake Canada and the United States was realized by several Canadian newspaper proprietors. They saw clearly that the wasteful destruction of our pulp for-

> ests, by man and fire, unbalanced by reforestation, must whittle away our visible supply toward an early vanishing point.
>
> "At that time the president of the Toronto Globe, the proprietor of the Hamilton Spectator and the publisher of the Montreal Star held a conference in Toronto and, agreeing as to the menacing outlook, took steps to inquire into the feasibility of establishing a paper mill on the Nepigon river, and engaged Thomas Pringle and Son, engineers, of Montreal, to report upon it. The report was unfavorable.
>
> "By forestry, milling and newspaper experts I was then advised to become interested in a sufficient number of newspapers to secure an aggregate order for white paper of at least one hundred tons a day and by inducing all the publishers to install the same sized presses the whole output of the paper mill would be of uniform size, which would reduce the cost of production to a minimum. This seemed to be the best solution of the problem of how to get a permanent and adequate supply of paper.
>
> "This is the secret of my seeking an interest in other newspapers. In every case where I am interested I have succeeded in convincing the managers of these papers of the wisdom of joining with me in assembling the orders for paper, with a view to ultimately taking up a mill's whole output. This simply is a business policy which has commended itself to every newspaper man to whom I have presented it. Of not a single paper outside of the Star, which is the only paper I own, do I attempt to dictate the policy."

The above statement was given out in reply to a published statement by the Hon. W. S. Fielding, giving his reasons for retiring from the Presidency of the Telegraph Publishing Company. Sir Hugh Graham has always found it most difficult to keep men with any kind of a democratic spirit in his employ, and it is not exceptional the Hon. Mr. Fielding could not work in sympathy with him. Commenting on this situation, the "Toronto Globe" says:—

> Mr. W. S. Fielding has done great service to all other working journalists and to the Press of Canada in declining the office of editorial responsibility for a newspaper venture the ultimate control of which was kept secret from himself and from the public. **The newspaper situation in Montreal during recent months, its manipulations, its mergers, its mock conflicts and secret agreements, has been to honest and self-respecting men in the craft a disgust and a discouragement.** The good name of journalism has been trailed in the dust. The man in the street and the man in the college were led to mock at the public Press, at its sincerity as an organ of public opinion, at the alleged subservience of men of conscience and character to the money power of private interests that dare not show their hand. To that sneer, this that Mr. Fielding has done is a direct and unequivocal answer.
>
> And it is done at real personal sacrifice. Mr. Fielding is no longer a young man. It is many years since he retired from newwspaper work in Halifax. His Parliamentary life brought the rewards of honest and capable public service, but those rewards were not financial. For many years Canada's Minister of Finance, he never made material gain out of his special and rare opportunities. He went out of office as he entered office, a poor man. The editorial opportunities in Canada for a journalist of his standing are very few. To refuse one of the few, to refuse it knowing the cost, and to refuse it because the controlling power behind its management was kept secret, is a thing for which W. S. Fielding will be honored by every honest-minded journalist in Canada.
>
> What matter if that secret power was pure in its motives and noble in its purposes. It was secret. Secrecy of control is the unpardonable crime of the Press in the United States, destroying its independence, and making it not the servant and defender of public interests but, because secret, their most dangerous enemy. Harmsworth's offence in the bedevilment of British journalism is at least public, confessed, openly cynical. This American method, secret and sinister, prostitutes to the basest private ends both the profession and the men it uses, while all the time it professes independence, honesty, and the public weal. No explanations, no protests, will explain away or justify that studied secrecy. That the light has been focussed on the evil in Canada before as yet it may be too late to preserve the honor of Canadian journalists and journalism is a great matter for which gratitude is due to the Hon. W. S. Fielding, not from his fellow-craftsmen merely, but from the whole Canadian public.

The Canadian Courier, commenting on the situation, very aptly puts it as follows:—

> Journalists all over Canada will greatly regret these events. The idea that any capitalist, however able, can hire a number of prominent writers and use them as political puppets, is one which all good journalists resent. If Sir Hugh persists in his attempt to control the editorial utterances of the Herald-Telegraph, La Patrie, and La Presse, in addition to those of his own paper, The Star, he will either drag the good name of journalism in the mud or make an ignominious failure. The Northcliffe idea cannot flourish in the fresh atmosphere of the North American continent.

The appearance of Sir Hugh Graham in the roll of conservationist under these circumstances must make the pulp and paper men smile audibly. It is well known that the paper mills in this country are the most efficient in their operation of any in the World, and while we have many wastes yet to be corrected, the correction can never come from people whose ambition is selfish aggrandizement.

A financial paper commenting on this situation, says as follows:—

"Sir Hugh Graham's endeavor to conserve the National Resources of this great Dominion of ours, by curtailment of paper consumption, stands alone as a monument of patriotic and self-sacrificing duty to the people. A small interest in the Herald and Witness, however, will hardly suffice to preserve more than a few hundred million feet of pulp timber annually, and it may still be necessary for our journalistic knight to buy the Calgary Eye-opener or the Longueuil Trumpeter."

The situation, however, is too serious for levity, and it behooves the pulp and paper manufacturers to take a united stand against such mis-guided devotees of the dollar as Sir Hugh Graham has proven himself to be.

Labor in Lumber Camps

It is very interesting to note that during the past winter, which has been one of industrial depression, and decreased labor market, that lumbermen have experienced the greatest difficulty in obtaining suitable labor for lumber camps. The hue and cry for labor that is heard in the large cities in Canada, where so many have been out of work during the past few months, does not ring true when we see throughout the country thousands of men needed for work of this kind, which is easily the best kind of unskilled work we have. Thousands of men have been hanging around cities filling up the bread lines and soup kitchens, when the largest industry we have in this country was sore in need of men to gather their supply of raw material to keep their mills and factories going for the next year. Every year, the difficulty recurs of obtaining sufficient men to go to the woods for the logging operations. It was expected that this year on account of the abundant supply of labor this difficulty would be avoided. We find, however, that these predictions were not borne out. The ordinary labor available in Canada of foreign extraction do not seem inclined to take to this kind of work. For this reason, their pleas for employment often fall on deaf ears. Work in lumber camps is undoubtedly as fine work as unskilled labor can engage in. The conditions are healthy, the food is good and it is always warm working in the woods. How much better are these conditions than what is usually found in construction camps, where men live in shacks and lean to's, with flapping tarred paper and chilly Canadian winter breezes adding to the discomfort. A campaign of some sort pointing out the advantages of this work would indeed be in the interests of lumbering and paper manufacturers.

Editorial Comment

After considerable delay, the Postmaster has announced the detailed memorandum of the Parcels Post System and put the same into effect this week. It has been decided to adopt the zone system in fixing parcels post rates on account of the large ratio of area to population in the Dominion.

The first rate is five cents for the first pound and one cent for each additional pound or fraction thereof, up to four pounds and two cents for each subsequent pound up to eleven pounds within a radius of twenty miles from the place of mailing, irrespective of provincial boundaries. This is to give local merchants an advantage within their own neighborhood and also farmers and gardeners who can use the mails for sending produce to their local market at a low rate.

A parcel of eleven pounds can be sent twenty miles for two cents a pound and this should give the farmers a decided advantage.

The system has been simplified as much as possible. For each Province there is to be a special rate card, on which the Postmasters can see at a glance what are the local rates and the charges for forwarding parcels to other Provinces, etc.

There will be seven major Provincial zones, the Maritime Provinces comprising one. In sending a parcel across the continent there will be an additional charge for each additional zone or Province through which it passes.

The introduction of this parcels post into Canada is of the greatest importance to the paper industry. With the growing use of paper containers for all kinds of merchandise, including groceries, there is no doubt that it will mean a phenomenal advance in the use of board and heavy wrappings and even in the lighter wrappings in Canada. Those, however, who expect this jump to be immediate and at first striking will, of course, be disappointed. The lag of human nature will show itself, and it will be some time before people will appreciate the value and advantages of the parcels post system. This will tend to keep the sudden consumption of these grades to a healthy and steady advance. There is a suggestion in this for paper interests in that we should take advantage of it through advertising and in selling the product. The market will not come itself, but must be solicited, and manufacturers should first themselves appreciate the opportunities, and then attempt to make the consumers share their appreciation.

* * * *

The Companies Case ,which was recently decided in Ottawa in favor of the E. B. Eddy Company by the majority opinion of the court, which maintained the right of provincial incorporations to do business in other provinces as well as being subject to provincial regulation and taxation, is up for attention again. Since the court was not unanimous, and because there is still much uncertainty with respect to the matter, the case is to be carried on appeal to the Judicial Committee of the Privy Council for final adjudication. important constitutional questions are involved, and if the provincial contention is sustained, federally incorporated companies will also be subject to provincial regulations and, in fact, be little better than charters from the provinces. If the judgment is reversed, the provinces stand to lose a source of profitable revenue or, at least, have such revenue reduced. A conference of provincial premiers held in Ottawa last October asked that the case be considered closed, but it is thought best to appeal to the Privy Council to have the matter finally settled. The case is being watched with great interest, and there is no doubt that the contention of the provinces should be decided against.

* * * *

The annual gathering of the Canadian Lumbermen held in Ottawa on the 3rd inst. was the occasion of a careful discussion of lumbering conditions in this country. Mr. J. R. Booth was elected Honorary President.

A great deal of important discussion came up regarding the Workmen's Compensation Bill recently brought up in Ontario. Senator Edwards made a vigorous attack on the proposed bill, calling it socialism of the worst kind. He said that it will mean the closing of factories, the lessening of employment, and in every case it would mean that the employer would always come off second best. It is a measure of the most vicious kind, and the general opinion of the entire association was decidedly against the bill. It has been pointed out in these columns before that the bill is a menace to the pulp and paper interests as well, and we fail to see how such a bill could become law.

Another matter of interest brought out at the association was the opening of the Panama Canal. But the association was agreed that little benefit would be derived in the Canadian lumber industry by this new development. On the whole the convention of the Lumbermen's Association was extremely good and the

* * * *

A Bill has come up before the present session of the House of Commons limiting the hours of work for workmen and in public works to eight hours per day. It also stipulates that the material supplied under contracts for such works shall be manufactured under similar conditions. This Act has, of course, been introduced at the instigations of the Labor Unions. It is by no means a fair proposition, but should be allowed to regulate itself as other work does. There will be a great deal of public work of special natures which are not covered by the clause "Extraordinary Emergency" which would require longer hours. Another great difficulty in this connection is the fact that in towns where other industries are situated, this would cause the greatest labor difficulty by having such systems introduced. For example, in pulp mills where it is impossible to work such hours, a great deal of discontent would be aroused. It is to be hoped that this Bill will not become law, but that the matter will be allowed to adjust itself, according to the regular conditions.

THE USE OF RUMBLING BARRELS

By E. S. HOLLOWAY.

While so much to-day is being said about the conservation of our forests not only from fire, but also by the closer utilization of their products, we hear very little about remedying the wasteful methods of barking wood by knife barkers for the manufacture of pulp. It was an endeavour to ascertain whether the newer types of rumbling barkers produced satisfactory wood for the preparation of pulp that the writer visited several of the best pulp and paper mills in Canada and the United States using this type of barker, in which the bark is removed by abrasion leaving the wood intact, thus resulting not only in a saving of fibre but also in a reduction of the labour cost of barking.

It is a matter of common knowledge that the loss in preparing or barking wood by knife barkers is very heavy, usually reaching 25 to 30 per cent of the volume of the rough wood, although many tests on different types of knife barkers in some cases equipped with one of the mechanical turning attachments have given results much lower than this, and in fact, as low as 12 to 15 per cent, but it must be borne in mind that when such tests are being made the operators of the machines are aware of the fact, and consequently pay more attention to their work which brings the percentage loss down to the minimum quoted above, but we must not figure on such a low loss as this for it is an established fact that few operators are careful enough to remove only the bark, losing sight of the value of the loss of wood in their endeavour to obtain the greatest possible output from their machines, whereas by using rumblers the loss is cut down to 8 or 10 per cent being only the volume occupied by the bark—resulting in a saving of about 20 per cent of the volume of the rough wood.

So much can be said for and against the rumbler depending on the point of view of seller or buyer of wood that it is rather difficult to get at the real truth, naturally the buyer of wood wishing to obtain the cleanest and best wood available and also the greatest possible volume of solid wood per cord, claims these conditions are best obtained by purchasing rossed wood, and consequently asserts that rumbler wood is not sufficiently clean and that he does not receive as much solid wood from the cord of rumble wood as from one of rossed wood—due to the rossed wood being more cylindrical and straight and therefore piling closer. Investigation shows that provided the wood is sound and properly rumbled it is sufficiently clean, this is borne out by the fact that many mills are now using rumblers on their own wood and find the products satisfactory.

The writer has seen samples of unbleached sulphite pulp made from 90 per cent rumbled and 10 per cent rossed wood, which are as satisfactory as can be, being remarkably free from specks.

Such mills are reaping the double benefit of obtaining 20 per cent greater production of pulp per gross cord and being able to utilize much smaller diameter wood, which could not be barked in a knife machine due to the danger to the operator and to the enormous percentage loss of barking small stuff, this is in itself an important factor, encouraging the use of rumblers in this day of shortage and high price of pulp work, and also carries out the modern idea of conservation by utilizing the tops which would otherwise remain in the forest and increase the fire hazard.

It might be pointed out that the utilization of these tops gives a market for small diameter sticks obtained from the lopping of tops making it possible to practice lopping at a profit, and thus assisting in the fire protection of our standing forests and also assisting towards their reproduction, naturally the buyer is not so vitally concerned along these lines, but at the same time he would insure to himself a longer supply at the present price. In regard to closeness of piling, it is claimed that as much pulp can be obtained from a cord of rumbler wood as from one of rossed, for the reason that in rumbled wood the sap wood is intact, and that a greater quantity of pulp can be obtained from a unit volume of sap wood than from the same volume of heart wood, however, it is the writer's opinion that, provided the rough wood entering the rumbler is of good quality and reasonably straight and well trimmed, the quantity of solid wood per cord will not materially differ from the solid content of rossed wood.

For the successful operations of rumblers much depends on the natural condition of the wood, for example, it is found that fresh cut wood barks more easily than wood which has season, some species bark easier than others—balsam being one of the easiest, much also depends on the method of bringing wood to the mill, a long drive by wate r has tendency to soften the bark and in the case of a rapid river much of the bark is removed while driving, permitting easy barking, but should the logs be much broomed on the drive it is difficult to bark them satisfactory as particles of bark are driven into the broomed ends producing specks in the finished paper.

There are two main types of rumbler backers, the continuous and the intermittent. The first consists of a large drum open at both ends through which passes a steady stream of either two foot or four foot wood, the interior of the drum is provided with several flanges, which act as retarders, forcing the wood to be rubbed one piece against the other and also against the interior of the drum, provision is made for the removal of the bark at the discharge end of the drum through a series of slots, water is admitted into the drum, aiding the removal of the bark, and also washing it away, a drum 47 feet long and 8 feet diameter revolving on outside supports similar to a ball mill at 8 r. p. m. and set on a slope of 1 in 15, has a capacity of 10 cords per hour, by this is meant that ten cords are completely barked, more wood than this goes through, but usually 5 to 10 per cent of the wood has to be sent through a second time in order to completely clean it. The intermittent type consists of a larger and shorter drum revolving on a 12-inch hollow shaft, through which water is admitted to the interior of the drum, charging is effected through a removable section of the drum, a drum 14 foot in diameter and 10 feet long requires 6½ cords to charge it and as 2½ hours are required to charge, bark and empty the drum, the capacity is 2½ cords per hour, about 10 per cent of this wood has got to be either sent through a second time or cleaned by hand.

The main objections to the use of rumblers are that often the ends of the sticks are broomed and during the rumbling, small particles of bark are driven into the broomed ends, and, secondly, the fibre of the wood gets crushed by striking on the projecting flanges on the inside of the drum, thus driving small particles of bark into the fibre, in the case of the continuous rumbler, it is the writer's belief that the first of these difficulties can be remedied by having openings along the whole length of the drum to get rid of the bark as soon as it is removed, and by also using copious quantities of water projected into the drum at a high velocity to aid in the losing of the bark and to wash it away, it is apparently not absolutely necessary to have projecting flanges on the inside of the drum, and if these were removed, it would remedy the second difficulty, it would probably be necessary to decrease the slope of the drum in order that the wood would remain in the drum a sufficiently long time to remove the bark—this idea is partly carried out at the Great Northern Plant at Millinocket, Me., where the drum, instead of being a continuous one, is made in several sections, set on the same driving shaft and having a gap of about 3 inches between each section, permitting the exit of the bark more quickly. The general opinion is that a drum 8 feet in diameter should be revolved at about 8 r.p.m. for the best results—higher speed than this throws the wood too much to obtain the proper rubbing effect.

It is difficult to get rid of the bark quickly in the intermittent type of machine, which the writer investigated, this machine holds the bark and wood together during the time of rumbling and it was necessary to wash out the drum after each batch had been run through.

The writer understands that there is an intermittent machine in use in which the drum is supported on a hollow shaft not running completely through it, during the rumbling, water is forced through one side and out the other, carrying the detached bark with it, however, he has not had an opportunity of studying this type of machine but understands that the results are quite satisfactory.

Taking into consideration the labour power and speed and efficiency of barking, there seems to be no doubt that the continuous machine is the most satisfactory type of rumbler as will be seen from the annexed table of performance and cost of operation.

The general concensus of opinion of the users of rumblers is that they produce entirely satisfactory wood for making ground wood pulp or for sulphite of lower grades, but for the preparation of sulphite pulp for high grade paper, they must be carefully watched to get satisfactory results, but at the same time mill operators would not be too ready to buy wood barked by rumblers, for should any defects show up in the finished product, it would be hard to locate the trouble in their own mill, as one department would throw the blame to another, and eventually the producer of the wood would have to assume the blame, but this, in the writer's opinion, is only a hypothetical objection to their more extensive use, as with careful inspection perfectly satisfactory wood can be produced at a much lower cost, and at the same time permitting the closer utilization of our forests.

It is to be hoped that we shall see more of these machines in use in the near future as they are so much more economical than the knife barker, not only in lower cost of operation, but also in their enormous saving of raw material.

Table Showing Approximate Relative Cost of Barking Including Conveying to Machine.

Name	Prod. Cords per hr.	H.P. regd.	Labor man p.hr.	Hours per cord		Cost in cts. per c'd		Annual Cap'l Cost $	Ann'l Chg. I.&D. $	output Cords	Cts. pr. Cd.	Tl.ct. pr.cd. Cts.
				H.P.	Labor	H.P.	L.					
Contin's..	10	20–25	1.5	2–2.5	.15	.6	3	5000	1000	60000	1.7	5.3
Interm'nt	2.5	30–40	1.5	12–16	.6	4.0	12	4000	800	15000	5.3	21.3
Ord.Kn'e	.7	9	1.5	12.8	2.1	3.5	42	300	60	4200	1.4	46.9
Kn.M.Tn	1.4	12	1.5	8.6	1.07	2.4	21	350	70	8400	.8	24.2
Kn.Wi'm	2.5	18	1.5	7.2	.6	2.0	12	750	150	15000	1.0	15.0

Labor, 20c. hour; Power, $20 H. P. year; 300 days of 20 hrs.

FUEL BRICKETS FROM SULPHITE LYE.

In the beginning of October, subscriptions were invited in Sweden to form a company with a capital of $146,667, to purchase and use Strehlenert's patent for fuel brickets of sulphite lye. A Norwegian company was, however, also bidding for the patent, and finally the two have been amalgamated. At a meeting held in Gothenburg it was decided to arrange a Norwegian-Swedish company, with a capital of $426,667, for this purpose. Messrs. And. H. Kiaer & Co., of Fredrikstad, have undertaken to provide the greater part of the capital. The location of the company will be in Norway. Mr. Hellstrom, C.E., will join the board of directors, representing the Swedish interests. It is intended to form subsidiary companies for utilizing the process in other countries where cellulose is produced.

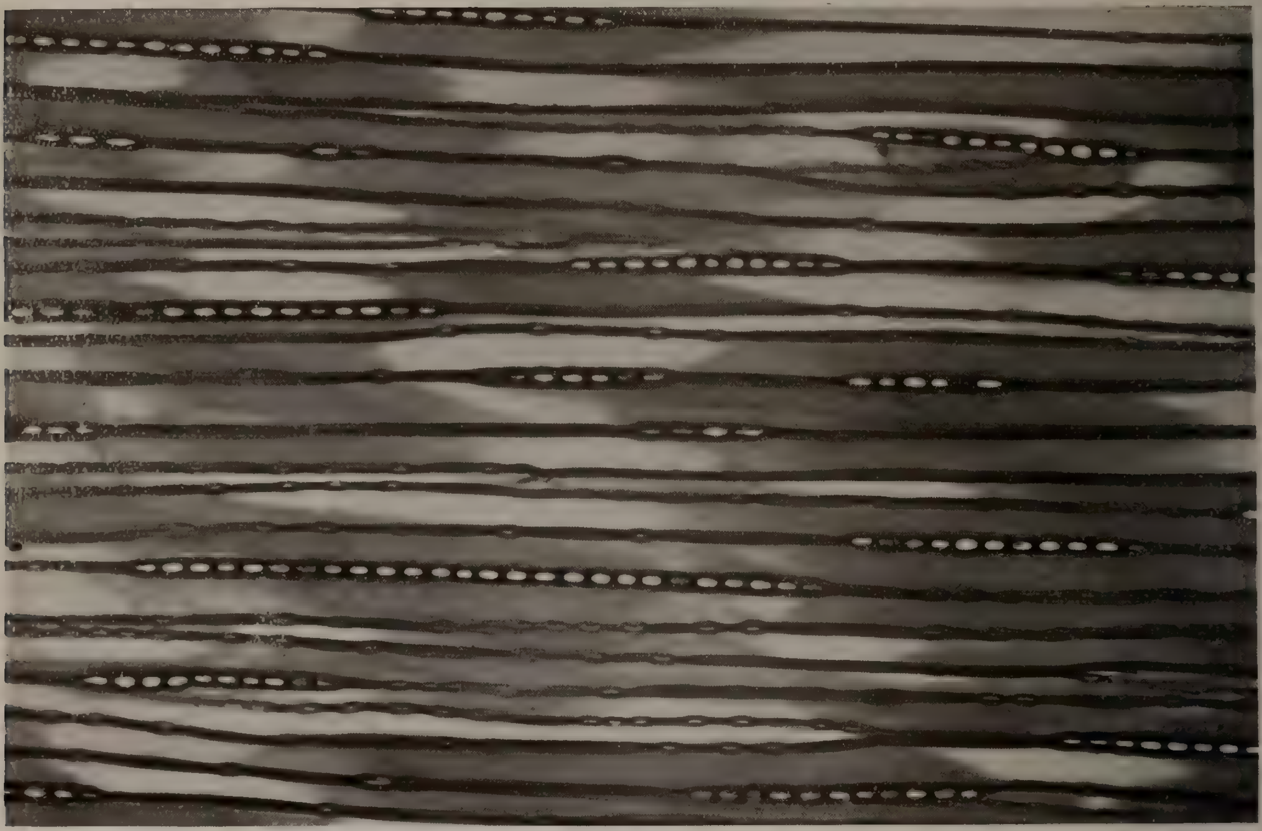
REDUCED DUTY ON NEWS PAPER INTO BELGIUM.

A Belgian law, dated August 30, 1913, provides for the reduction of duty on paper for newspapers from 4 francs to 2 francs per 100 kilos. In order to be admitted at the reduced rate, shipments of paper must fulfil the following requirements prescribed by Decree of September 13: The paper must be imported in long rolls, on reels; it must be not less than 45 centimetres wide; it must be of the quality ordinarily used for newspapers; it must be white, or only slightly tinted; it must have a rough or uncalendered surface; it must contain at least 70 per cent mechanical wood pulp and weigh not less than 45 grams nor more than 60 grams per square metre; it must not be more than half-sized. Importers must satisfy the customs authorities as to the use of the paper in the printing of newspapers.

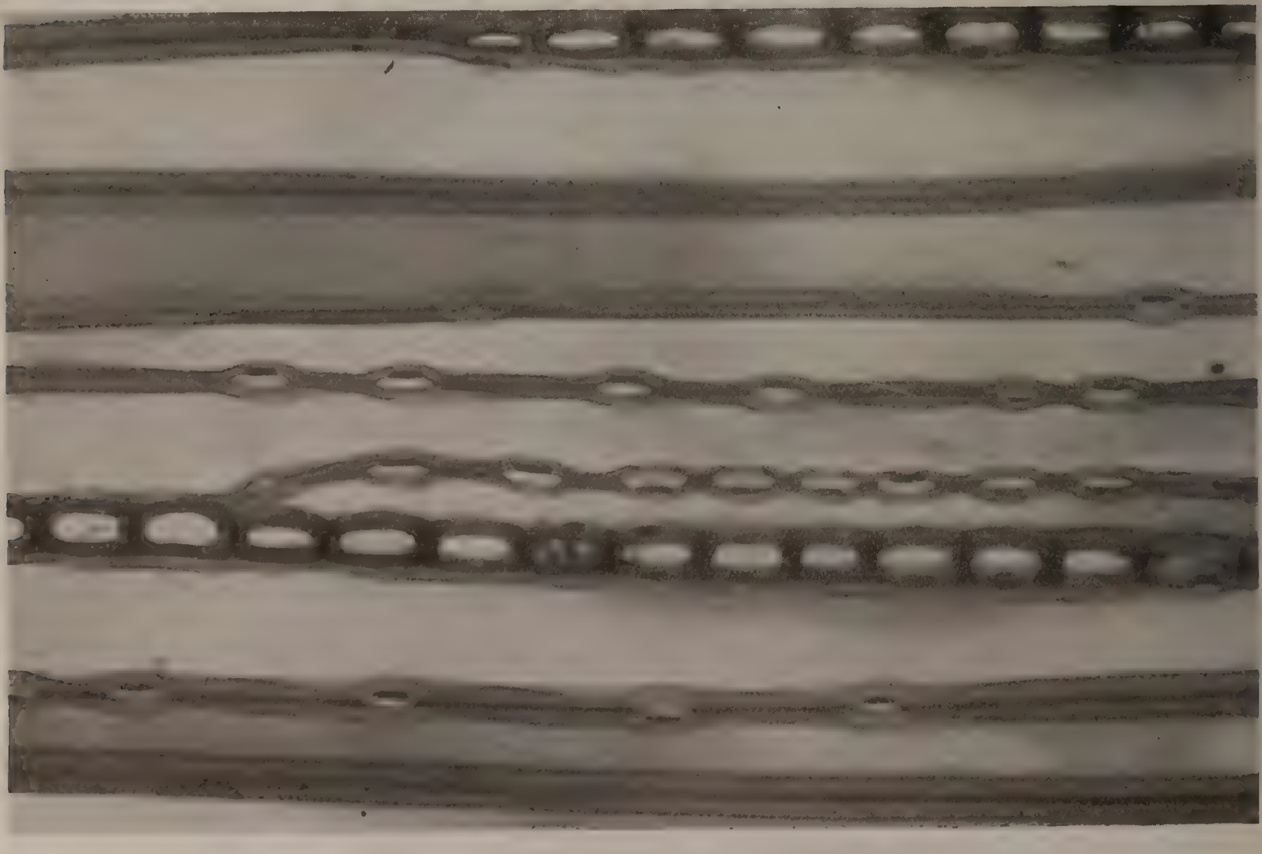
Micro. Photographs of Paper Making Woods---BALSAM FIR

Made under the direction of H. D. TIEMANS, U.S. Forest Products Laboratory, Madison, Wis.

(Continued from last issue.)



ABIES BALSAMEA—Balsam Fir Tangential x 210



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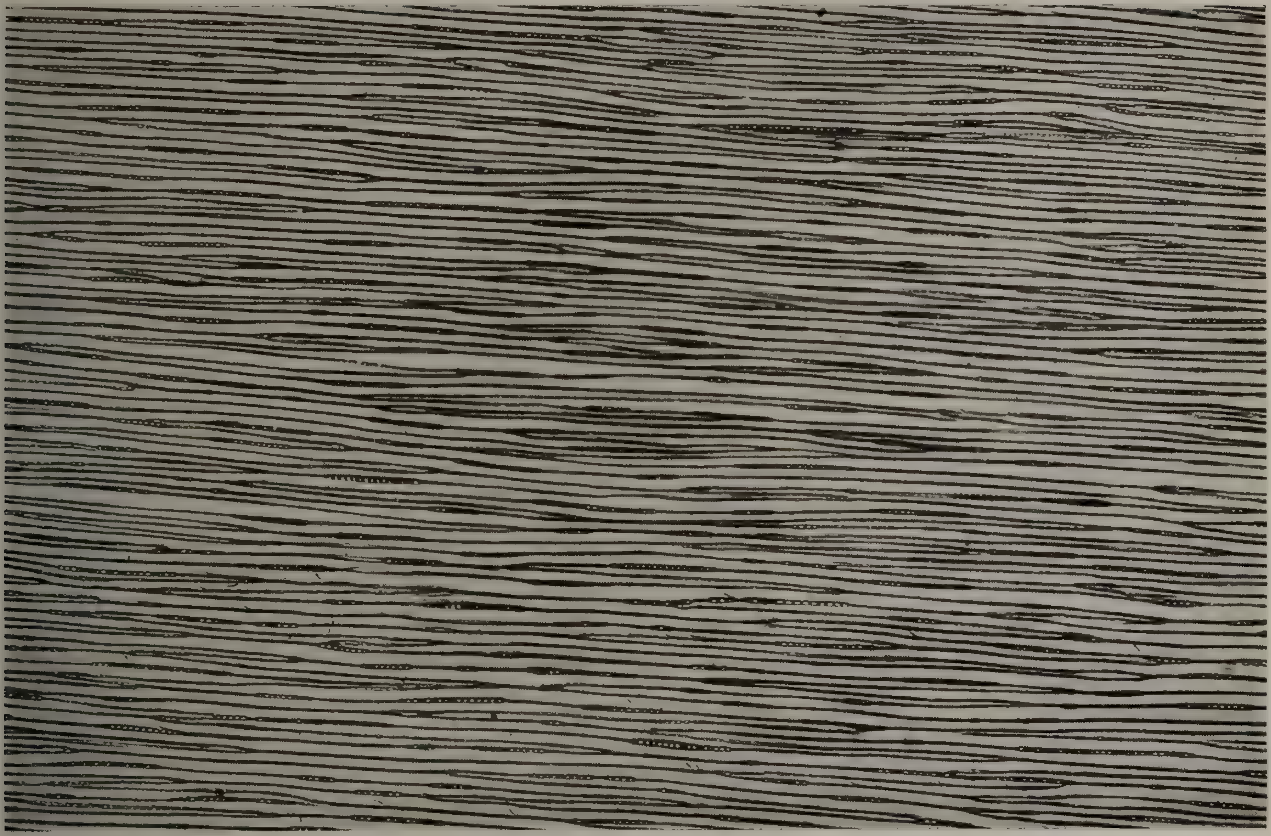

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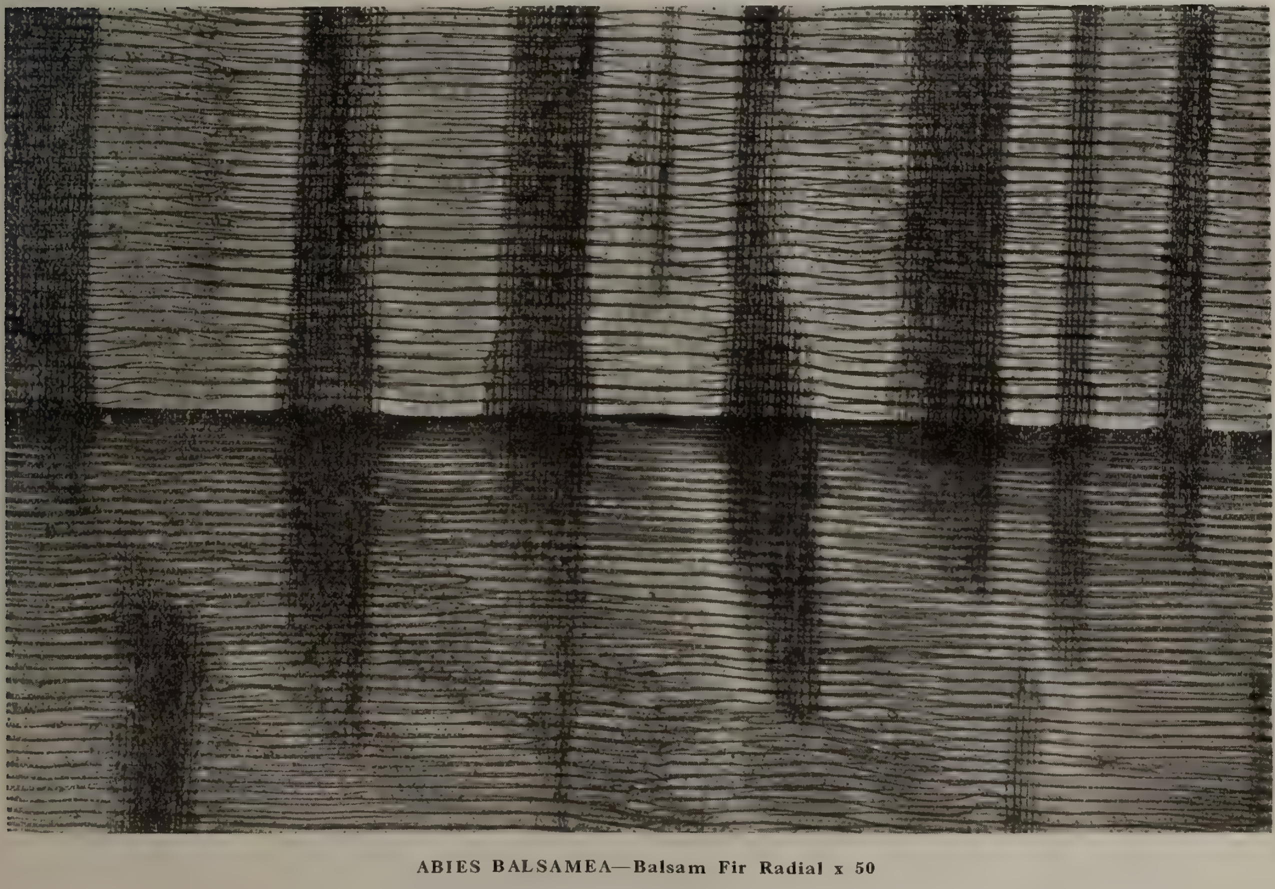

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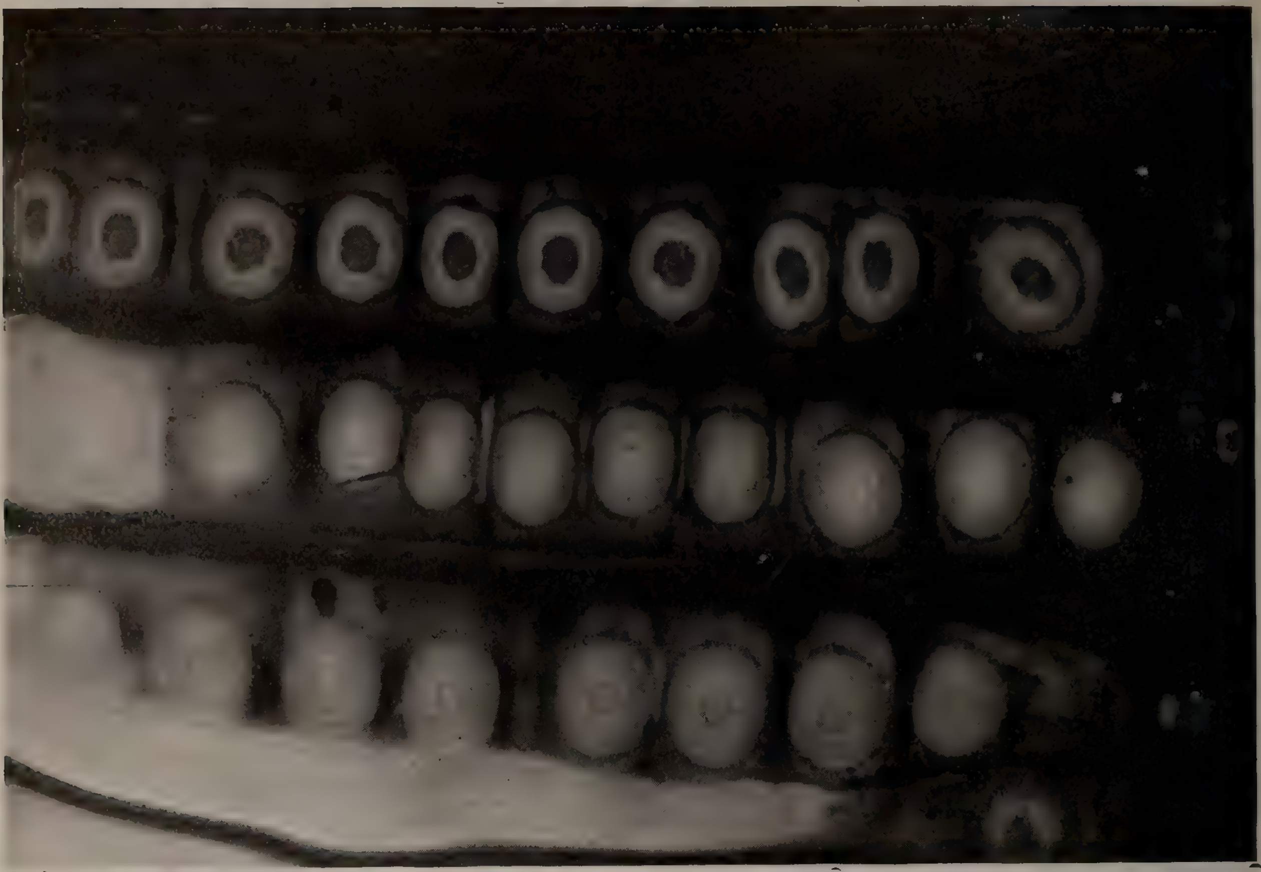
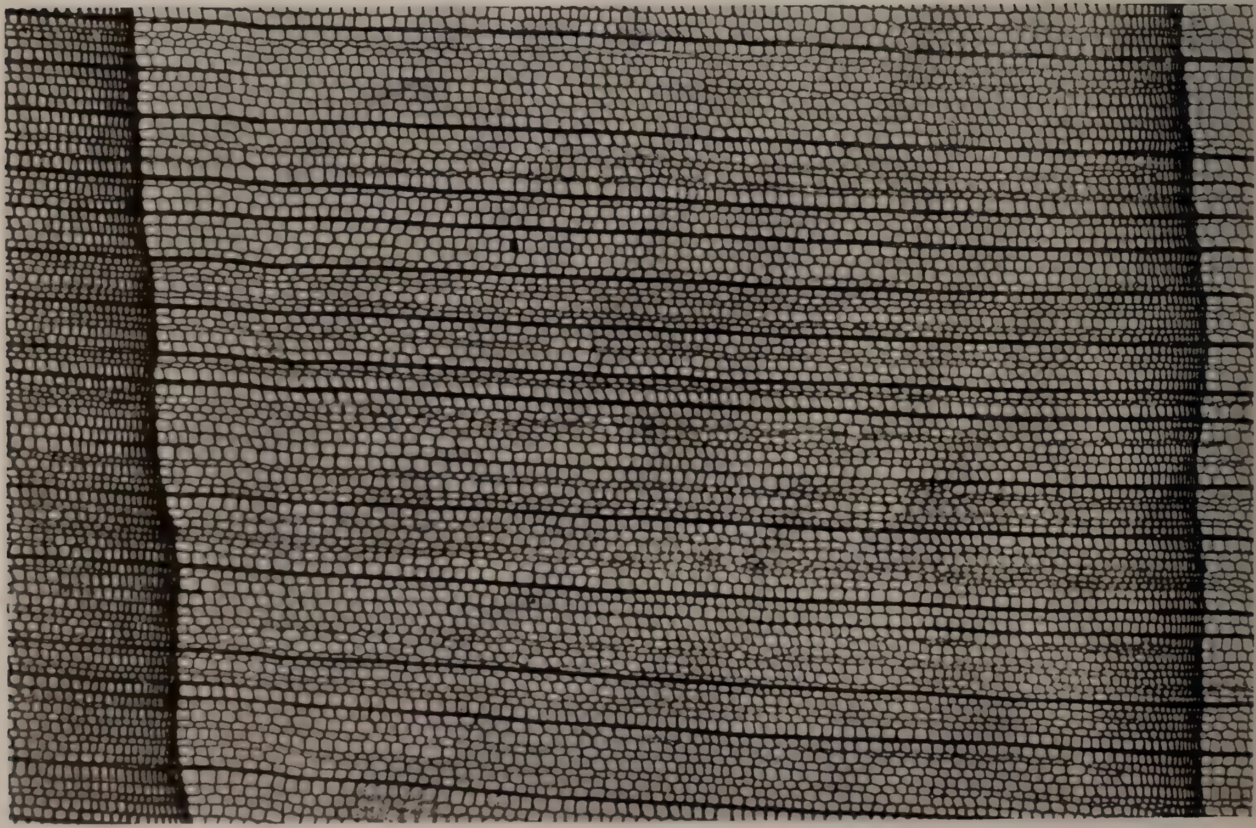
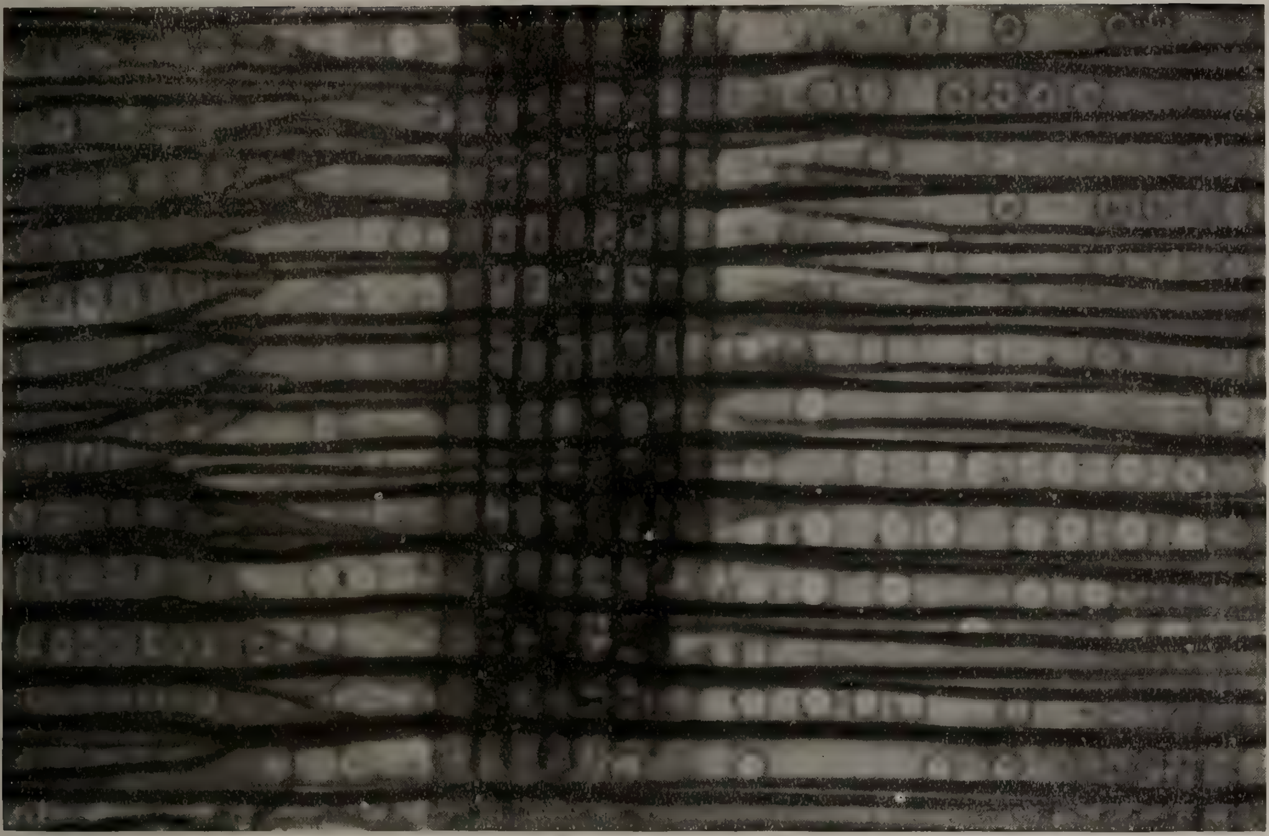


ABIES BALSAMEA—Balsam Fir, Border Pits x 680



ABIES BALSAMEA—Balsam Fir Transverse x 50



ABIES BALSAMEA—Balsam Fir Radial x 250

AMERICAN WRITING PAPER CO.

Holyoke, Mass., February 10, 1914.

The American Writing Paper Company has issued its report for the year ended December 31, 1913. The income account compares as follows:—

	1913.	1912.	1911.
Net earnings. . .	$ 943,910	$1,489,762	$1,400,096
Other inc.	105,943	111,887	125,435
Total inc..	1,049,853	1,601,649	1,525,531
Bond interest . .	850,000	850,000	850,000
Other ded.. . . .	329,043	306,392	312,208
Deficit.	129,190	*445,257	*363,323
Sink. fund	100,000	100,000	100,000
Deficit	229,190	*345,257	*263,323
Dividends	124,805	249,610	249,564
Deficit	353,995	*95,647	*13,579

The balance sheet of the American Writing as at December 31, 1913, shows assets as follows: Investment and real estate, $15,687,906; goodwill, trademarks, etc., $18.010.150; curernt assets, $6,114,356; sinking fund $1,908,000; total $42,720,412.

Liabilities: Prefererd stock, $12,500,000; common stock, $9,500,000; bonds, $17,000,000; accounts payable, $51,380; reserve fund $3,145,411; profit and loss surplus $523,621; total $42,720,412.

At the meeting of the directors last Wednesday, W. N. Caldwell resigned as president, which office he held for ten years. Mr. Caldwell's retirement is due to ill-health. No successor was elected.

The directors amended the by-laws creating the office of chairman of the board and elected Mr. Caldwell to that office.

The other officers elected were: Kingsley L. Martin, first vice-president; George B. Noble, second vice-president; Edwin Gould, third vice-president; Alfred Leeds, general manager; Edward H. Hall, treasurer; W. C. Wharfield, assistant treasurer, and Edwin S. Smith, secretary.

With the retirement of Mr. Caldwell, Kingsley L. Martin, formerly of Brooklyn and formerly Bridge Commissioner of Greater New York, and commander of the Second Naval Militia of Brooklyn, has become the acting head of the company. Mr. Martin went to the company a few months ago as vice-president and general manager, with a view to rehabilitating it. It has been learned that under his direction the selling organization of the company is being steadily strengthened through the acquisition of good men and that the mills and machinery are being gone over to improve their efficiency and to insure the highest quality of output at the lowest cost of production.

COLORING FOR EASTER EGGS.

Lee, Mass., February 10, 1914.

The Eaton-Dikeman Company of this place, has brought experiments to a successful conclusion, and they have manufactured eight tons of paper to be used in the coloring of Easter eggs.

The paper has been sold and shipped to parties in Jersey City, N.J., and Bloomsburgh, Pa. The paper is cut into squares 3 x 3 inches in size and eight different shades may be made. The quantity of paper will be sufficient to color over a million eggs.

Heretofore the Easter eggs have been colored by the use of tablets that are manufactured in Germany. In Jersey City and Blomsburgh the paper will be cut in strips and put in envelopes for easier distribution to all parts of the world. A strip of the paper is dissolved in warm water and then the egg is placed in the water and the coloring trick is accomplished.

THE UTILISATION OF WOOD PULP IN TEXTILE MANUFACTURING.

Some Interesting Facts in Regard to this Product.

By H. A. CARTER.

Artificial silk manufactured from wood pulp is today very largely used for the production of braiding, furniture upholsteries, knitted neck-ties for gentlemen's wear, straw hat bands, and other like goods, and the inventors of the processes by which it is produced, are using every endeavor to further perfect them in such a manner that the product can be still more widely employed. Some details of an article which has during recent years made its way so extensively into textile manufacturing will, accordingly, be of interest.

The trees which provide the product are two subgroups. The Sugar Cane, or bamboo, do not seem to ordinary people to be related to the cereals, but the botanist regards them as very closely related to each other. They are Spermatophytes, that is seed bearing plants of the two groups Gymnosperms (naked or exposed seeds), and Angiosperms (enclosed seeds). Coniferae, Pine Spruce, Monoctyledons, Bamboo, Sugar Cane, Dicotyledons; Poplar. A plant may be described as a structure, or a collection of structural elements, which grows and builds up tissue, this it does through its assimilating organs, which are the leaves. The roots aid in the process by taking up nutriment from the soil.

The weight of a wood depends upon the state of the wood in respect to moisture, and upon the proportion of small weighty lignified vessels, such as might be termed centre wood, which is denser than the more distended vessels composing the sap wood. Poplar is a very light wood, and Spruce and Pine are light. The hardness of a wood is measured in terms of the number of kilograms needed to force a punch of 1 sq. cm. in area to a depth of 1.27 mm. into the wood perpendicular to the direction of the fibres. The strength of a wood is the resistance offered by it to any force having a disposition to break the fibres across transversely, or to get the better of the cohesion of the fibres, or longitudinal stress.

What has been said gives some idea of the fitness of any particular wood, or woody substance, for converting into a fibrous raw article. Such woods should contain a large proportion of long cells, or fibre, and for cheap production of Artificial Silk wood pulp the large annual stem possesses properties of growth, transport, and treatment which are very satisfactory. Such woods are obtained from Norway, France, Italy, Roumania, Great Britain, Canada, America, Russia, Austria-Hungary, Germany, Sweden and Spain.

Two methods are employed to convert these woods into pulp, by one they are broken up by wet-grinding to a mechanical pulp, after which they contain no constituents which are soluble in water, the other method is a chemical formulae which, acting upon the woody components, change them into secondary substances which are soluble, leaving the cellulose, which maintains the form and sizes of the original fibres, making a chemical pulp made up of the fibrous structural parts of the wood in the completely resolved condition. There are only a few woods that are really suitable for treating in this manner, and coniferous woods, and poplar are ones made use of.

Wood is always a composition of carbon compounds, and carbon is best described as pure charcoal, an elementary substance bright, brittle, and having no smell. The composition of woods varies, and the differences met with are marked, and distinguish the various kinds, but these differences are merely small departures from a class which is universal.

Lignification has been described by a German Chemist, of repute, as the formation of a cellulose derivative by combination with certain acid, and unsaturated, ketonic groups, the resulting compound being ligno-cellulose, and by different processes which act on these acid, and unsaturated, groups the ligno-cellulose is converted into secondary products of the last-named, which, are soluble, and cellulose, which is resistant and insoluble. Ketones are a class of bodies derived from the fatty acids by the substitution of the hydroxyl of the latter by a monad positive radicle.

The cellulose in the condition of these soluble secondary products, or derivatives, is a structureless colloid. In the plastic state it may be made to assume any form, and so it is produced in Artificial Silk works in filament, or thread. What is most noticeable in the cellulose in these artificial conditions is a continuity of substance. In changing from the condition of solution to the eventual solid state, there are no breaks in this continuity, and the structural features of these artificial forms are conditioned by this circumstance.

Wood pulp manufactured into artificial silk has 50 per cent less breaking strain per unit denier than natural silk; and its extensibility under breaking strain is 8 per cent less. The true elasticity of both is the same.

Strehlenert says, referring to breaking lengths expressed in terms of kilogrammes per square millimetre of section, which is a good ground of comparison, considering that the two products have been proved to possess a very similar structure; the relationship between natural silks, and the artificial silk products, is as under:—

	Dry.	Wet.
Natural China Raw Silk	53.2	46.7
,, French ,, ,,	50.4	4.09
,, ,, boiled off	25.5	13.6
,, ,, dyed red, weighted	20.0	15.6
" ,, blue black @ 110 per cent	12.1	8.0
Artificial Silks, Chardonnet, Nitrate process	14.7	1.7
Lustra, Lehner, Nitrate process	17.1	4.3
Celluloses, Glanztoff, Cuprammonium process	19.1	3.2
,, Viscose, Xanthate process	21.5	5.3

Celulose is equally resistant to change for the artificial silks obtained by widely varying processes, such as by treating cotton by the Chardonnet and Lehner processes are, in their properties, closely akin to the fabrics, or threads, produced from wood pulp, by the Glanztoff and Ciscose systems.

Fibres generally may be looked upon as the strength giving parts of plant structure, and to quite understand the chemistry of woods the jute fibre should be studied as a structural type, and the jute substance as a typical ligno-cellulose. It may be taken to hold the middle position between the cellulose, and the perennial woods, and it may be said to be, as a rule, the case in connection with the distinguishing reactions of these bodies. Jute, if treated by the cuprammonium reagent is almost wholly dissolved, but it has little effect on the ligno-cellulose of the woods, and strong solutions of the caustic alkalis mercerise jute, and fibrous ligno-celluloses, of similar components, but not upon the woods.

It has been estimated that Germany, Norway, Sweden, Finland, America, and Canada produce per annum, between them, 4,628,000 tons (air dry) of mechanical and chemical wood pulp. The wood comes into consuming districts in logs measuring 8 feet x 4 feet x 4 feet. The Aspen, Balsam, Basswood, Fir, Pine, Spruce, and Tamarac trees, all yield commercial wood pulp.

The manufacture from wood pulp of paper owes its origin to J. C. Schaffer, a priest, who made paper of good quality from several species of wood, about the year 1770, but the production of artificial silk yarns from wood pulp is comparatively a recent invention, but very little was heard of this prior to year 1890, although, no doubt, experiments in the direction were being carried out by at least a few inventors. Samples were exhibited in England for the first time, in bulk, abut 1893. The Chardonnet process had not been working very long at Besancon before the manufacturing of artificial silk threads from wood pulp commenced, and the industry has since grown very rapidly, cotton is, however, our type of chemically balanced cellulose, and is of a higher order of stability than the wood celluloses. Wood cellulose is always a residue of chemical processes.

The cellulose in particular in the form of artificial silk is treated with formaldehyde in aqueous solution containing, in addition, auxiliary agents, which determine combination, and as a result of the combination there is, experts state, some constitutional change in the cellulose itself, accompany the fixation of the H2 CO groups, which gives proof of a power of internal structural modification that opens up an interesting field for study.

Two means are employed for the bleaching of wood pulp, the most common being the use of ordinary bleaching powder, the second the treatment of the pulp by solutions of soda, or magnesia, prepared by electrolysing the chlorides.

The celluloses in the form of ultimate fibres are the unit elements of structure of the yarns, and threads, which are the basis of textile fabrics. The processes by which they are mechanically prepared, and then spun into thread are determined by their dimensions. Artificial silk may be said to be structureless, as it is prepared from structureless solutions of cellulose derivatives, it in this way is like true silk, which is produced in solution in the glands of the silkworm, and turned out into the atmosphere, the worm doing the mechanical process of drawing and laying the threads in the specialised form of cocoon. Cellulose allows of very hard treatment in going through a cycle of operations, and reverting to an amorphous substance which retains much of the structural properties of the original.

In addition to the manufacture of artificial silk from wood pulp by the Glanztoff and Viscose processes a very important new textile has lately been produced from the product, namely "Silvalin" yarn, samples of which spun into various counts applicable for many different purposes, dyed and plain, were exhibited at the City Hall Exhibition, held in Manchester in October last year, in connection with the Textile Industries, together with numerous examples of the yarns woven into piece-goods, curtains, mats, carpets, etc., etc., and were very favourably commented upon. R. Kron has devised a method for the spinning of this Silvalin yarn in which the production of the original pulp strips is intensified at its full width, the web being subdivided into narrow strips by an arrangement for projecting jets of water upon the web, at such distances that the web is divided into 100-500 strips per metre. The separation of the strips is, however, not thus completed, they are wound upon a roll of the full width, and are afterwards separated, and detached as discs. It is based upon a patent covering process for twisting, or spinning, the cellulose (pulp) directly from pulp rolls, on addition patents, (1) for winding up the wet web at breadth of the machine to be afterwards divided in pulp discs of suitable narrow width. (2) Improvements in the manufacture of pulp rolls in a moist but coherent state, and patents for process, and apparatus, for winding up moist strips of paper pulp, etc. Process and apparatus for subdividing a web of pulp (as on the wet sud of a paper machine), into strips. Apparatus for direct delivery of moist pulp strips, and spinning machine for preparation of detachable cops.

The Kron process proceeds as under. The formation of the web on the Fourdrinier wire, its subdivision into strips by the impact of jets of water for the number of strips required to be formed. The pulp strips are submitted to the action of press rolls for the gradual removal of water and progressive solidification of the fibrous mass, it is then, further, dried by heat on a steam heated cylinder, and then wound up in what is called a magazine roll, which so holds a series of discs in close contact. These are detached as needed for the further process of twisting, and are set out for winding off in a horizontal, or inclined, position below the spindles.

The winding-off and twisting, calls for the passage through the machine which is the subject matter of the fourth patent named, the apparatus from which the strips are delivered continuously to spindles. These have a speed of 3,000 to 8,000 revolutions per minute with the sliver travelling at 8 to 16 metres per minute, according to the size of the yarn, and the degree of twist needed.

It has been estimated that this description of yarns made from pure wood-cellulose have a mean breaking length of 5 to 7 k.m., with an extensibility of 6 to 7 per cent.

Warps of wood pulp yarn need no previous dressing or sizing. The goods when finished have about one half the strength of jute materials of the same make, and weight. They lose their tensile quality completely when wet, but regain their strength in drying. This is a serious drawback on these materials, but so long as they are kept dry they are all right. Wall coverings, stair matting, braids, webbing, furniture coverings, upholsteries, hatbands, canvas for tennis shoes, overalls for workmen and tweeds made of wool and silvalin, and worsted and silvalin suitings were exhibited at the recent Manchester Exhibition in addition to the goods already named. Some of these only contained from 25 to 100 per cent of silvalin, however. One exhibit which looked very well was a handsome hanging, or cover, for a drawing room mantle board. String and cordage made from the material was also shown. The natural colour of the yarn is a light brown, and in this such colours as crimson, blue, green, etc., show up in very good relief. The material, in fact, takes the dye remarkably well, and the stall which the Silvalin Yarn Spinning Co., of Manchester, had at the exhibition attracted an unusual amount of attention from visitors.

The yarns and cloths can be, of course, bleached white. Two systems are employed for the bleaching of wood pulp, the most common being the use of ordinary bleaching powder, the second being the treatment of the pulp with solutions of hypochlorite of soda, or magnesia, prepared by electrolysing the chlorides as already stated.

The bleaching of wood pulp by means of a clear solution of ordinary chloride of lime is simple, and may be said to be fundamentally a process of oxidation. The method consists in immersion of the pulp in a given quantity of diluted bleach liquor of definite strength but many modifications are available, and they need to be closely studied in order to produce the best results economically. If wood pulp be well washed in warm water before bleaching this gives it a greatly improved colour. Large quantities of paper are, of course, manufactured from wood pulp ,and one of the earliest, and largest works formed in England to carry on this industry is that of the Kellner Partington Paper Pulp Co., Ltd., of Barrow-in-Furness.

With respect to artificial silk manufactured from wood pulp, its breaking length in kilometres averages 12.0, and its elasticity is 2.0.

As a chemical individual, wood cellulose differs but little from cotton cellulose, and where only chemical relationships are involved there is an obvious probability of the former being able to substitute cotton as a basis of manufacture. For such substitution there is always the induceemnt of relatively low market price.

Artificial silk yarn, or as it is often called Lustra cellulose, is used largely for ladies belts, table covers are also made from it. Belgian manufacturers utilise it largely also, for figured effects, especially in linings, it is also employed extensively for making tapestries, and furniture covers. It is further used largely for wide and narrow braiding. Ether and alcohol are two agents which are greatly used in the production of lustra-cellulose thread from wood pulp.

Herr Emil, Claviez, a Saxon, has also invented a process for making thread, somewhat like silvalin yarn, from wood pulp. This is based upon a finished, but unsized, paper, as a raw material. This is cut into fine strips of a few mm's width, each strip being separately wound in a bobbin, which is then transferred to a spinning or twisting frame. In the condition of twist it is submitted to a rolling process to consolidate the thread, and this treatment is repeated after moistening the thread in a second machine, the speed of which is regulated to give a certain drawing effect.

The spindle for the spinning, or twisting, of the paper strips has a spool, or reel, carrying the paper strip of 2-3 mm. width, and this is carried on a hollow brass axis, which is held in position on the spindle by means of springs. The fliers rotate in the same direction in which the paper strip was wound on the spool, the slip is thus twisted, and drawn off through rollers under a suitable tension. The yarns produced under this system are known as "Xylolin," and they compete successfully against Jute yarns.

Just as various means are employed in textile manufacturing for giving a high degree of twist to textile yarns in their final form the same principles, and form of machine, are pressed into the service of the paper pulp spinner. The twisting of the yarn is done on ring spindle machine frames, which have 60 to 70 spindles on the side. In spinning weft yarns, the delivery of the spun yarn varied, which permits of it being wound directly into cops, or on to tubes placed over the spindles. With respect to the effectiveness of this method two restrictions apply, one is the method of making the pulp strips in a "cylinder" machine; the alternate process and machine founded on the flat running Fourdrinier wire with its much higher productive efficiency is taken by Kron process as the basis of their system. The second restriction, with regard to output, and accordingly economic production, is in the speed of the machine, and process of rounding and consolidating the strips. A machine of 80 spindles having a running speed of 12-15 m per minute, will produce from 1,382,400 m. to 1,728,000 m. per diem, off which 30 per cent. must be knocked for breaks and stoppages. A beating engine of the Hollander type with 160 to 200kg. dry pulp capacity, dealing with four charges in the 24 hours, will feed two of these special machines.

Viscose, which in thread or yarn is an artificial silk, is formed by a combination of celulose with acid groups, the compound is soluble only in alkaline liquids, it decomposes by its own force with reformation of cellulose. The first step in the viscose process of artificial silk manufacture is the conversion of the cellulose by treatment with caustic soda solution at mercerising strength. The wood pulp may be treated with the alkaline lye by reducing the wood pulp in a kollergang with water sufficient to cause the disintegration of the sheets, and then adding the calculated quantity of caustic soda dissolved in a quantity of water sufficient to produce a mixture of cellulose 25 to 30 per cent., caustic soda 12.5 to 15 per cent, and water 62.5 to 55 per cent, or the sheets may be steeped in excess of a lye of 17.5 per cent caustic soda, lift, drain from the excess, press to a calculated weight, and then grind in a mixer to secure even admixture of the mercerising reagent with the cellulose.

There are at least a few classes of knit goods, or what may be termed knit-goods, in connection with which wood pulp artificial silk and such yarns as are produced by the Silvalin Company, and the Claviez and other processes, are of interest, for one both descriptions would answer well for knit fringes on curtains, overmantles, and similar goods, the yarn produced by the last named two systems has not the lustre of the first named or of artificial silk manufactured by the gun cotton process, indeed, no lustre whatever was to be seen in the samples exhibited at the late Textile Machinery Accessories Exhibition held in Manchester to which reference has already been made, nevertheless, the goods looked very nice indeed, particularly those which had had designs printed upon them. On the light brown background of the Silvalin cloth, they were, in fact, very artistic. Having this colour they would not need many washings, owing to soiling rapidly, if made into fringe knit materials, golf bags, holdalls, rucksacks, etc., and other lines might be struck of this class in connection with which they will prove of value.

With respect to the gun cotton, and artificial silks, it is doubtful whether they will ever give complete satisfaction when manufactured into piece goods for general wear such as ladies dress goods, so, though for braiding, ladies belts, neckties, straw hat bands, and so on, the yarns answer very well, and a very good demand exists for them for these, and the other purposes which have been already named.

Celulose may be said to be the non-nitrogenous skeleton of vegetable tissues.

The rise of the various wood pulp manufacturing industries has led to great forest devastations, and in some cases the governing authorities have had to pass laws restricting within certain bounds the cutting down of trees to meet the demand for raw supplies.

The utility of wood pulp yarn, and the methods employed in its manufacture were discussed at a meeting of the London Section of the Society of Dyers and Colourists, held lately, and the fact that the yarns lose their tensile strength entirely in wetting, and that they have only half the strength of jute fabrics of the same weight, and make, was named.

After soaking in cold water, the "Kron" yarn seems to lose 75 per cent of its strength, but still has a breaking strain of 170 grms. The yarns have an elasticity of 6 to 7 per cent, and a breaking strain of 5 to 7 kilos. It is difficult, however, without trial to estimate what would be the behaviour of such yarns under practical wearing conditions, especially when they are woven with other fibres, and although the former statement may be true in itself, yet in the actual use of such yarns, in practice, more satisfactory results have been obtained than might be expected.

For example, a sample of table cloth material which has been in use in Germany for three years, with constant washing, is still quite good. It contains some 60 per cent of this yarn.

It is only by actual trial that the working properties of such materials can be tested, and these seem to be satisfactory within certain limits, which may be regarded as giving the yarns a place in the textile industry.

The yarns are manufactured in Germany in one factory to an amount of 6 to 7 tons per week. Factories are being erected that will devote themselves particularly to its use in the manufacture of sacks, and suchlike materials. At the same time these yarns have an actual decorative value, many really beautiful products being obtainable.

Dyeing seems to present no difficulties, and may even be conducted in the yarn state.

These products will have special interest to the dyer, and the cleaner, who may once more have their working conditions rendered more difficult. The many uses that this yarn has been put to include the manufacture of wall and paper coverings, hessians, tarpaulings, braids, some of which have been knit goods, hat bands, to which the same remark applies, tweeds, suitings, and overalls, and many other cloths of varying make, in addition to the use of the yarns themselves in the shape of twine and string.

The value of the paper pulp in yarn form has been expressed by O. N. Witt in terms of the comparative value of one c.m. of wood, which has been put at 3s. Transferred into paper it has a value of £1 15s., into paper yarn £2 5s., and into artificial silk £7 10s. These figures are significant.

Paper yarn is now being spun, and cloth woven from it at Dundee, in Scotland, in a mill which has been specially fitted for the purpose, and the proprietors of the mill, who have been putting forward great efforts in connection with the business for some time past, are meeting with considerable success in the venture. The firm in question is Messrs. Ferguson & Co., of Bedville Works, Lochee Road, Dundee, Scotland.

SIZING TROUBLES.

According to an article in the Papier Zeitung, it occasionally happens that rosin sized papers may show perfectly satisfactory sizing immediately after their manufacture, but may show a gradual deterioration in sizing during storage for a few weeks or months. The most usual cause of this trouble lies in the manner of drying the paper, whereby moister layers of fibres in the interior of the sheet are enclosed by thin hard sized layers on the outsides. To avoid this condition of things the drying must be so regulated that the paper reaches a high degree of heat while it still contains a large proportion of moisture. The particles of rosin precipitated on the fibre can only fuse together to form a waterproof protective coating when the paper is heated up quickly after passing the first drying cylinder, which, however, should only be moderately heated. The object of the second cylinder and those immediately following should be to heat the paper up quickly without driving off very much of the moisture; these cylinders, therefore, should be very hot. This moist heating has the effect of softening the particles of rosin and causing them to unite, whereas if the paper is allowed to become too dry before any great heat is applied the rosin particles, at any rate in the interior layers, will not be united, but remain in a powdery form, however great the heat may be on the later cylinders of the machine. Papers prepared from "wet beaten" stock are very liable to this kind of fault.

Papers which have to be calendered on separate machines are damped, reeled up and allowed to condition before calendering. This damping is very beneficial for papers which have been dried in a proper manner, but in the case of those papers which, through improper drying, are poorly sized in the interior of the sheet, the damping brings out the fault. The soft sized interior portions absorb an undue amount of moisture and in the glazing calenders these extra moist constituents are squeezed up to the surface so that the paper becomes soft sized. Paper which is well heated up on the earlier cylinders of the machine has the rosin thoroughly united throughout its mass, and it can be dried with a gradually moderated temperature in the later drying cylinders, with the result that it may be brought into condition with only a slight damping so that the sizing is not affected by the calendering.

Another important point in obtaining, well sized papers, in the writer's opinion, is the order in which the sizing agents are added to the beated. It is important to add the size before the alum, in order that not merely the exterior of the fibres, but also the interior, may become impregnated with particles of rosin. If the alum be added first this gets inside the fibres and precipitates the subsequently added rosin before the latter can enter. The diluted size should be added at least a quarter of an hour before the alum; it is recommended that the mineral loading be added after sizing, about a quarter of an hour before the beater is discharged.

The Frank H. Harris Lumber Co., Limited, Toronto, has been granted a provincial charter with a capital stock of $40,000 to take over the business now carried on by the Frank H. Harris Lumber Company. The concern is given wide powers, including the right to carry on saw mills and timber growing and to manufacture and deal in timber and woods of all kinds, as well as to buy timber estates. The incorporators are: Wm. H. Harris, Frank H. Harris, Joseph Walmsley, Harry Crighton, and others, all of Toronto.

The Hand-Made Paper Industry in England

(By Our London Representative.)

Eleventh century writers tell us that the peoples notable for producing papers by their hands were always great naval nations, and they cited as an illustration, England's progress in the industry. The first methods of making paper, however, may be placed to the credit of the Chinese of early days, but for energy, and for bringing the hand-made industry to a high state of efficiency and perfection, the English people—though they are in possession of the greatest and largest naval force in the world—have surpassed all rivals. To-day the centre of the hand-made trade is in the county of Kent—the land of flowers and hops—and it is to this part of England that we look for high grade papers to supply all parts of the world.

Machine-made paper, of course, has very materially limited the supply of hand-made on the market, this being largely attributable to the forest resources of Canada and other pulp producing countries, and to scientific research work. But the largest of London printers admit to-day that for letter-press work, or any other work, they prefer the hand-made material best of all, but its high price militates against its general use.

Another keen competitor the hand-made paper mill has is the machine mould-made paper mill, and to place samples from these two mills side by side, it would take an experienced expert who understood the production of both mill papers to say what was the difference between them, and which was mould-made and which was hand-made. I have seen experts make mistakes over the papers, and I have seen people take up mould-made paper in their hands and express their gratification on the fact that a British mill could turn out such a high-class "hand-made" product. It is only natural, therefore, that in the estimation of large printers who, do letter-press work, they recommend the use of mould-made as an excellent substitute to hand-made paper. But let me say that the production of mould-made paper with the "hand-made" appearance is as secret as the grave in which our forefathers lie, and the hand-made paper producers would forfeit all they have in their possessions to ascertain the internal workings of their rivals. It would be a great event if that discovery was made, but the mould-made producers must protect their ingenious inventions, not only for their own purposes, but as keen competitors with the hand-made mills.

Notwithstanding, all the rivalry that the hand-made paper industry has to contend with, the mills are in a flourishing condition, and they are turning over good profits. The mill owners do not complain so much of the competition experienced from machine made paper as they do of the alleged imitations of hand-made paper, which is put on the market. These imitations are a "sore thorn in their sides," because there is a great demand in England for the good hand-made product, and amongst the supporters of hand-made are the principal government offices, which, of course, include the Stationery Office. For the protection of their trade there is the Hand-Made Papermakers' Union—a body of which very little is known, so secret are its meetings and meeting places—and one of its objects is to put down fraudulent imitations of the hand-made article which the Merchandise Marks Act (an Act usually enforced by the Trade Board) did not seem to stop. Therefore, employers and all their employees are constantly on the look-out for people selling machine paper in England as hand-made, but so far the number of prosecutions has been extremely small. Last year was a very good period for the mills in the hand-made industry, but the number of vats in the trade was at a low ebb. In 1913 the number was 68, the lowest recorded since 1894; but it seems singular to record that the quantity of paper turned out, or the tonnage, was far greater last year than ten years ago.

As a rule, in the month of January in each year, there is gathering of the "clans" engaged in the hand-made paper industry in Kent. The employers and their workers all meet and they discuss the position of affairs, some of the speeches being most interesting. At this year's gathering, Mr. C. H. Balston (Springfield Mill, Maidstone) remarked that their business might be old-fashioned and conducted on old-fashioned lines, but they did like to think in these days of so much industrial unrest that amongst the hand-made papermakers' that old time feeling of friendship still prevailed. With reference to the past year, he had had an opportunity of looking into the figures, and found they had sent away more paper than they did in 1912. That was encouraging, because, it showed that the hand-made paper trade was not going to die yet. It was for them to see that the users of their paper were thoroughly satisfied with it, and to this end they must not relax their efforts for a single moment, but rather redouble them. Their policy had always been to keep up the manufacture as high as possible, and the stability of their trade showed that had been a good policy. But they must not rest there. Competition grew keener every day, and they must look to the organization and economy of the mill, to the efficiency of the machinery and the workpeople, and they must see there was no waste whatever.

The name of Balston has been associated with the hand-made industry for over 100 years, as the mills have been handed down from father to son. Mr. F. Crispin, another speaker, regretted that the hand-made paper industry had not been as prosperous as they all desired, but they were glad that a good trade generally with a genuine article had been maintained. The action taken by the Employers' Association of inviting co-operation of the members of the workmen's society to assist them by bringing to their notice cases of machine paper being sold as hand-made, would have a very decided effect upon the trade. He hoped it would result in increased trade, and he was sure every member of the workmen's society would cordially respect the invitation. If the principle underlying the invitation was more generally acted upon, it would prove advantageous to all engaged in the hand-made paper trade. Mr. E. C. Riddle (rag department of Springfield Mill, Maidstone), pointed out that employers had been compelled to seek new sources for trade, and one of thees was the industry of cards, which were used for a variety of purposes. Everyone knew the reputation Springfield Mill had for its paper. The reputation was world-wide and the class of paper turned out left the foreigners far behind, as the amount of paper sent abroad was really amazing. In one week Springfield Mill was distributing paper to all corners of the globe—Canada, Japan, Russia, Germany, Australia, America, etc. Very few mills in the world could produce such a record, and it was almost done in one day. Personally, he believed the hand-made paper industry had a big future before it and there was plenty of room for hand-made paper as well as other productions. He hoped those who were making imitation papers would have the courage to call them what they were.

Mr. W. Burgess (chief foreman at Springfield Mill) said it was true that vats had been shut down at some mills, but others had been opened elsewhere. Generally, it was the small mills that had disappeared, and the large mills that had increased, and it was just possible that those which had closed would not have done so had they kept to making the very best of paper. The main thing for a mill to rely on was the turning out of the very best article. If they did that, the hand-made paper trade had a capital future before it.

Forestry Convention

(Special to Pulp and Paper Magazine.)

Ottawa, Feb. 10.—That a National Forestry Congress, the first since 1906, will be called in Canada early next year was one of the most important announcements made at the annual meeting of the Canadian Forestry Association, held here last week, and largely attended by lumbermen, pulp and paper manufacturers and others, connected with the timber industry, who are its members.

After presenting reports and electing officers, the Association waited on Premier Borden and some of his Ministers with certain recommendations concerning forestry matters. The Prime Minister took this opportunity of suggesting that a National Forestry Congress be held, and it was decided to ask him to call one in January or February of 1915, accordingly. The last Congress of this kind was held in Ottawa in 1906. The present one is more or less an outcome of a discussion in Parliament a week ago, when both the Leader of the Opposition and the Prime Minister, during a discussion over the estimates for the Commission of Conservation, approved of the idea of still further encouraging forestry work by means of a Congress.

The annual meeting of the association took place on Wednesday last. Features were the directors' report of work during the year, the election of officers and the framing of recommendations. The directors' report, after dealing with the last Forestry Convention, went on to state: "Looking over the general field, it is seen that the work of forest protection and reforestry has made steady, if not rapid, progress in 1913. The amount appropriated by the Dominion Government for the work of the Dominion Forestry branch was $541,000, and the work was carried on with an increased staff, particularly in the field, the number of men in the outside service being 360, of whom 25 were technically trained." The report went on to state that the fire loss during the year was the smallest in the history of the Department, the amount burned over being one-fiftieth of one per cent. of the reserve area.

The area in the reserves in the different provinces is now as follows: Manitoba, 4,108 square miles; Saskatchewan, 1,803 square miles; Alberta, 26,271 square miles; British Columbia, 3,782 square miles. The report detailed the amounts spent and the features of the work done in the different provinces in the line of forest protection, and showed that in Quebec $118,000 had been expended by the Government and $150,000 by the limit holders themselves, while the Province had commenced the planting up of sand lands with trees for pulpwood, and was extending its policy of creating township forest reserves. The Ontario Government's expenditure was $234,000, while the limit holders had added $91,000. British Columbia spent for fire protection the sum of $375,000; New Brunswick, $35,000, and Nova Scotia $8,000. The report went on to state that lumber and pulp companies were cutting their timber with less waste than ever before; a number of them were having their holdings surveyed and estimated by forest engineers, and some were beginning to experiment in thinning and replanting.

The following resolutions, besides a number of less important ones commending the Government for its forestry work, the establishment of a Forest Products laboratory, etc., were presented to the Government:

That before any lands bearing timber or lands contiguous to timber areas are opened for settlement an examination of such lands should be made to determine whether they are best suited to the growth of timber or whether their opening would endanger the timber.

That this Convention would urge upon the Dominion Government the necessity of the afforestation of the sand lands throughout the prairies and the setting apart of such lands for the purpose.

That this Convention accords its approval of the work of the Tree Planting division of the Dominion Forestry branch in providing practical demonstrations to settlers of the possibility of forest growth on the prairies.

That this Convention recommends that experiments be carried out by the Dominion and Provincial Governments to obtain data regarding the best methods of disposal of debris resulting from lumbering operations.

That this Association again expresses the opinion that it is important that all appointments in the forest service of the Dominion and Provincial Governments should be based on capability and experience.

Mr. William Power, M.P., of Quebec, was elected president of the Association; F. C. Whitman, of Annapolis Royal, N.S., as vice-president; while Hon. George Perley, of Ottawa; Hon. Dr. Roche, Minister of Interior; A. C. Flumervelt, of Vancouver; Hon. Nathaniel Curry, of Montreal; Mgr. Roy, of Quebec; H. R. MacMillan, chief forester of British Columbia; and Clyde Leavitt, chief forester of the Railway Commission, were added to the Board of Directors. It was decided to hold the next annual convention in Halifax.

PRICE BROS. TO OFFER SUBSIDIARY'S BONDS.

Price Bros. & Co. are shortly to offer $600,000 bonds of the Shipshaw Water Power Co., a subsidiary with a water development at Murdock Falls, about two miles from Kenogami.

The present installation develops 6,600 horse power, but provision is made in the power station to bring the capacity of the plant up to 10,000 h.p. at a cost of $40,000 for the additional unit. The company has entered into an agreement with Price Bros. by which it sells 5,000 h.p. at $15 per h.p.

Gross earnings of the power company are estimated at $75,000 for 1914, net at $67,000, and surplus after bond interest at $37,000. The installation of the additional power unit, it is stated, will enable Price Bros. to increase considerably the capacity of the Kenogami and Jonquiere plants.

The development of this power originally started during the construction ofthe Kenogami Mills. It has been separated from the original company and called the Shipshaw Water Power Co. This method of issuing additional bonds was adopted, instead of issuing straight Price Bros. bonds.

THE PRINT PAPER FIELD.

A Summary of the Year's Activities as Viewed by "The Fourth Estate"—Interesting Review of the Situation by Arthur C. Hastings.

In the anual review number of "The Fourth Estate" the print paper field was referred to at considerable length. A feature of the article was the following contribution from Arthur C. Hastings, president of the American Paper and Pulp Association:—

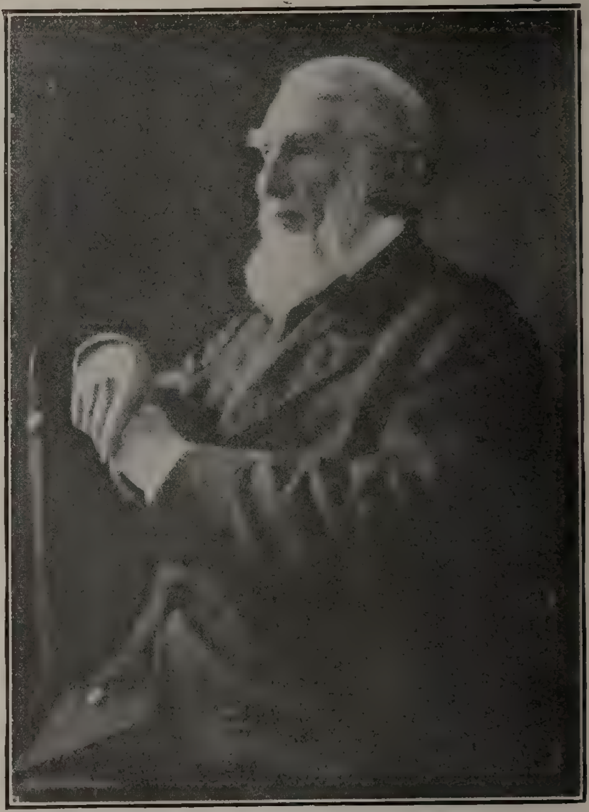
ANGUS McLEAN.
General Manager, Bathurst Lumber Co.
Recently Elected Second Vice-President of Canadian Lumbermen's Association.

E. R. COLBERT.
President Gummed Papers Ltd., recently organized at Brampton, Ont.

"The year 1913 in the general paper business has not been at all satisfactory. In the news print manufacturing branch the condition to-day is overproduction and increased imports, and the installation of new machinery and new mills have made it impossible for the average mill to secure any return on capital invested.

"When the enormous imports of printing paper from Canada alone are taken into consideration, which increased 90,000 tons in nine months of 1913, as compared with the same period of 1912, or at the rate of 120,000 tons a year, it is apparent that it is impossible for the American mills to operate their plants to their capacity.

"The natural tendency has, of course, been to lower prices somewhat, and the only plausible reason why they have not decreased more is because they are now, in most mills in the United States and in Canada, below the cost to manufacture, therefore it is fair to suppose that prices cannot go lower, and they must go higher. The constant increasing cost of production in 1913 over 1912, due to a rise in the cost of the chief ingredients in the manufacture of paper, as well as the constantly increasing cost of labor, is apparent.



JOHN R. BOOTH.
Recently elected Hon. Pres. Canadian Lumbermen's Association.

"I believe the only thing the manufacturers of this class of paper may look upon with satisfaction as to the last year's business, is the fact that they are aware that they are not making money, and they are aware that they must either lower the manufacturing cost or increase their selling price, if they are to continue in business, therefore, the outcome for the future, in my estimation, is somewhat encouraging.

"The effect of the recent tariff legislation has been as forecasted by the manufacturers. The only advantage we can see to the publishers has been the investment of money in mills in Canada, which investment so far has not been profitable. Temporarily this has led to overproduction, but eventually the demand must be somewhere near equal to the supply. Money will not be invested in unprofitable enterprises."

Newsprint Paper a World Commodity.

"The Fourth Estate," in its review, refers to the removal of the import duty on newsprint, which act, it points out, made this grade of paper a world commodity. In this connection it says:

A world commodity which flows unrestricted from the point of manufacture to that of consumption is controlled so far as price is concerned solely by the law of supply and demand. If the cost of distribution were based on a uniform charge per ton per mile, if the cost of raw materials and labor were the same at all points of manufacture, if the investment per ton of daily output were the same everywhere; if the quality were uniformly alike for all mills; if a daily quantity output were constant throughout the year; if the widths of all paper machines were equally suitable for all consumers; if all mills were located where they could be certain of train service each day in the year; and if all publishers were equally fair to deal with and paid their paper bills with equal promptness, then, and then only, could the whole problem be plotted and all publishers would know exactly where the economic point of supply is for each—and relatively few publishers would pay the same price.

The facts of the present are that transportation costs do not correspond with mileage, the problem is complicated by commodity rate theories—by long and short haul theories, water competition theories, winter and summer rate theories, theories of arbitraries conceded to long hauls to offset extra time in transit, on the theory of making non-competitive, long, roundabout hauls competitive, provided the commodity can stand the extra time.

Then, too, few paper mills are so situated that they can turn out a continuously uniform quantity, on account of high and low water, others are locked in the arms of winter, sometimes for weeks at a time.

Location and physical conditions naturally affect the investment cost per ton of daily product.

Raw materials vary greatly in cost, depending upon mill location; the nearer the mill is to cheap wood the greater the cost of everything else.

Ability and skill in mill management vary materially in different mills.

Uniform quality throughout the year is well nigh impossible.

Then again, one publisher wants one width rolls, another wants another.

One publisher wants one finish and his neighbor wants a different one.

One publisher wants a thousand tons this month and perhaps only 500 the next. One publisher wants a natural color and this a yellow white, another a reddish white, and then a bluish white, and so on, ad infinitum.

Production and Price.

In 1911 the consumption of newsprint paper in the United States was 1,372,579 tons; in 1912 it was 1,459,003 tons; in 1913 it will probably be well in excess of 1,500,000 tons (it will probably be two months before the exact figures can be given).

The increase of 1912 over 1911 was a little in excess of 6 per cent, and the increase of 1913 over 1912 will show almost 5 per cent. "The Fourth Estate" has looked thoroughly for some sound reason on which to base the hope that the price of newsprint paper may not advance. So far but one factor is apparent, and that is over-production, and the publisher who bases his operation upon its continuance will come to grief, for it is an economic fallacy.

Experts say that for 1913 for all kinds of paper made from wood, to supply only the United States, over 1,000,000 acres of land was denuded of its timber.

The price of newsprint paper in the period from January 1 to September fell until, in the latter month, it was $3 below the price it was on the first of the year. From September the price gradually went upward until at the close it was but $2 below.

EXTRACTION OF SULPHUR FROM IRON PYRITES.

W. A. Hall, British Patent 20,758.

The object of this process is to extract in one operation the sulphur from the pyrites principally as sulphur vapour instead of entirely as H_2S, as described in Patent No. 20757-12, where the pyrites is submitted to the combined action of a reducing flame and steam intended to furnish nascent hydrogen and oxygen. According to the present process, a very small amount of steam is supplied to the furnace in conjunction with the direct reducing flame, in order to prevent a loss of sulphur by formation of SO_2 and COS. In the performance of the invention a furnace is employed, heated internally by direct flame consisting of a mixture of producer gas and air, the amount of air admitted being so regulated that the flame produced, while not necessarily a highly reducing flame, is sufficiently reducing in character to combine with any free oxygen. Steam, or water which would be formed into steam, is passed in through inlets provided between the shelves, but in larger quantity between the lower shelves of the furnace, the furnace being provided with an outlet from which extends a long discharge pipe. Into this discharge pipe steam may also be passed. When the furnace has been raised to the proper degree of temperature, preferably somewhat above 700 deg. C., the pyrites is led thereinto in a continuous stream with the least admission of air possible. The pyrites should be agitated to the greatest possible extent while in the furnace, otherwise much less sulphur would be discharged. The products of combustion pass up through the long pipe, in which the temperature is reduced several hundred degrees, and the products of combustion pass out surcharged with yellow sulphur vapour without any appreciable admixture of SO_2. The discharge pipe leads the sulphur vapour and products of combustion to a gas-washing apparatus, where the atmosphere is quickly clarified by the precipitation of the finely divided sulphur in the water of the washer, from which water the sulphur is extracted by any desired means.

HOW TO BUY DYESTUFFS.

The Cassella Color Company are distributing a brochure to the dyestuff consuming industries, under the above title, which will no doubt be of interest to all dyers. The book does not pretend to be an exhaustive treatise on the subject which it discusses, it will, we believe, be sufficient in its way to make plain the efforts which this company has made to place both the buyer and the seller of dyestuff wares in a position of frank relationship to each other, where the qualities and characteristics of these important supplies may be fully determined and understood.

Abitibi.

Will Build 225 Ton News Mill.

A special general meeting of the Abitibi Pulp & Paper Co., Ltd., has been called for February 17th to consider plans for the re-organization of the company.

In an official statement issued it is stated that it is now proposed to extend the scope of the company and to proceed with the construction of a four-machine news plant of approximately 220 tons daily capacity, a sulphite mill of 60 tons capacity and to bring the capacity of the present ground wood mill up to 225 tons per day.

The authorized capital of the present company not being sufficient to carry out an undertaking so much larger than was first contemplated, it was found necessary either to increase the capital of the present company or to form a new company with a larger capitalization. The directors consider it preferable to incorporate a new company to take over all the assets and liabilities of the present company. It is now proposed to organize the Abitibi Power and Paper Company, Limited, with an authorized capital of $7,000,000, divided into $2,000,000 preferred and $5,000,000 of common with an authorized issue of $5,000,000 first mortgage six per cent serial gold bonds, and $1,000,000 debenture stock. Of these amounts $1,000,000 preferred, $2,500,000 of bonds, $1,000,000 of debenture stock, and $5,000,000 of common will be immediately issued.

Holders of preferred and common shares of the present company will receive an equal proportion of shares of prefererd and common in the new company.

The authorized capitalization of the new company is considerably in excess of present requirements and is sufficient to provide the additional capital necessary to double the present proposed capacity, and when completed the plant will have a capacity of from 400 to 500 tons of newsprint a day.

SHIRLEY OGILVIE, Vice-President and Treasurer.

The arrangement under which it is now proposed to proceed with the construction of the 225-ton paper mill will not in any way retard or interfere with the completion of the present pulp mill which it is expected will be in operation by the 1st of June, and, pending the construction of the paper mill, the profits originally anticipated as being derivable from the operation of the pulp mill will be available to the company.

It is expected that the newspaper plant will be finished and in operation by the 1st of April, 1915.

F. H. ANSON, President.

The present board of directors are:—F. H. Anson, president; Shirley Ogilvie, vice-president and treasurer; J. A. McAndrew, secretary and counsel; D. Lorne McGibbon, Sir Thomas Tait, Hon. Geo. Gordon, James Playfair, Victor E. Mitchell, K.C., and George E. Challes.

Location and Extent of the Company's Properties.

The pulp limits, water powers and mills of the company are within the territory surrouding Upper and Lower Abitibi Lakes and along the course of Abitibi River and its tributaries in the District of Temiskaming in the Province of Ontario. This district lying south of the forty-ninth parallel of latitude, which constitutes the southern boundary of the Province of Manitoba, forms part of the fertile clay belt of Northern Ontario, and is at present served by two lines of railway: the National Transcontinental and the Temiskaming and Northern Ontario. The limits are traversed east and west by the line of the National Transcontinental Railway a distance of fifty-four miles from a point sixteen miles east of the town of Cochrane to the interprovincial boundary between Ontario and Quebec. The line of the Temiskaming and Northern Ontario Railway, running north and south, is within a few miles of the western boundary of the limits. A branch line of this latter railway of about six miles in length, will be completed during the summer of 1913 from Iroquois Falls Junction to the location of the mills and townsite of the company at Iroquois Falls in the township of Teefy. Other lines of railway are projected to which the company's properties will be tributary. As a location for pulp and paper mills, Iroquois Falls is ideal.

The area embraced within the pulp limits is 1,560 square miles, or about 1,000,000 acres. The distance by water from Lake Abitibi to Iroquois Falls is approximately forty miles, and in this distance on the course of Abitibi River there are three excellent water powers, Couchiching, Twin and Iroquois Falls, capable of developing a total of over 50,000 horse power. At Iroquois Falls, five hundred acres of land have been reserved for mill site and water power development. Many military veteran land grants in the neighborhood have been purchased and others are being secured. These will be prepared for settlement, the value of the wood exceeding the whole cost.

Pulp Wood Supply.

The Abitibi pulp limit is held by the company under an Ontario Government concession, with terms and conditions similar to those granted to other pulp and paper companies in the province.

There are upon the limit millions of cords of pulp wood, principally spruce of the best quality for pulp and paper manufacture. The entire territory is well watered and can be most economically logged.

The close proximity of the standing timber to the mills, good driving streams, and the extremely short drive (less than two weeks) required for delivery of the timber from any part of the limit to the mills, and the ease and cheapness with which supplies can be taken into the lumbering camps, enable the company to deliver its wood at the mills at a very low cost, lower, in fact, than any other pulp company in Canada. The important element of labor in lumbering operations will be provided for, as the opportunity for winter employment for themselves and their horses will attract and be a boon to settlers, many of whom are taking up land in the fertile Northern Clay Belt. Agriculture, dairy and other products will be obtainable from the settlers. In addition to the practically inexhaustible supply upon the company's limit, the pulp wood cut by settlers in clearing their lands is available to the company.

The Black River district, directly tributary to the mills at Iroquois Falls and embracing a well-timbered area of about three thousand square miles, is open for settlement. Pulp wood cut by settlers in this district can be cheaply floated to the company's mills. Sufficient settlers' wood can be obtained to operate the company's mills at their full capacity for an extended period. The importance of this source of supply of raw material is increased by the fact that pulp and paper manufactured therefrom is admitted into the United States free of duty.

Water Power.

The possibility is being investigated of utilizing the waterpower on the Quinze River, near the head of Lake Temiskaming, for the development of electric power. The river for a distance of two or three miles, including falls and rapids, is owned by Mr. J. O'Brien, who has secured the services oa Messrs. Sutcliffe and Neelands, civil engineers, to obtain information. Mr. Neelands believes that the Quinze River has power enough to develop 270,000 horsepower, which he thinks would be sufficient to electrify the T. & N. O. Railway and to supply heat, power and light for all of the industries of Temiskaming, including the new one hundred-ton sulphite mill which will be erected by the Riordon Pulp and Paper Co. at Haileybury in 1915.

Commenting on the financial situation of the company, the "Journal of Commerce," the leading financial paper of Montreal, says editorially, as follows:—

"The announcement that the Abitibi Pulp & Paper Company was to be re-organized and additional capital secured did not come as a surprise to the 'street.' When the company was first organized, nearly two years ago, with a capitalization of $1,500,000 7 per cent cumulative convertible preferred stock of which $1,000,000 was issued and $3,500,000 common, of which $3,000,000 was issued. The Bond Issue consisted of $1,500,000 6 per cent bonds, of which $1,000,000 was issued. The company found that the period of depression and tight money seriously affected the subscriptions to their issues. In addition, the large number of new pulp and paper mills incorporated within recent years made it somewhat difficult for a new mill to break into the field. Unfortunately for them ,it also happened that the price of ground wood decreased, which made their venture an unprofitable one."

"Construction work in connection with their power plant and mill has been taking place in the interval, but as funds have become low, it was necessary to secure additional capital to bring the plans to completion. At the same time, the introduction of additional capital and new blood is being used to extend the original plans. Under the re-organization plans, a 225 ton news print mill will be built, also a 60 tons sulphite mill, in addition to the ground wood mill, which is supposed to have a capacity of 225 tons per day. The company will be re-organized and known as the Abitibi Power and Paper Co., Ltd., with an authorized capital of $7,000,000 divided into $2,000,000 preferred and $5,000,000 of common. In addition, there will be an authorized issue of $5,000,000 first mortgage 6 per cent bonds and $1,000,000 debenture stock. It is the intention to issue immediately $1,000,000 preferred $2,500,000 bonds, $1,000,000 debenture stock and $5,000,000 common."

"While the addition of a news print mill and a sulphite mill will improve the position of the company from a financial standpoint, it looks very much as if the old charge of over-capitalization can be levied with a good deal of truth against the new company. The company, as first organized, contained a good deal of water, which has not been squeezed out in the re-organization. American interests and American capital will be associated with F. H. Anson, and the directors of the old Abitibi Company."

"CATALOGS."

Some very interesting recent installations of Morris Overhead Runways are dealt with in Bulletin A-12, which we have just received from The Herbert Morris Crane & Hoist Company, Limited, Empress Works, Peter Street, Toronto.

Reproductions of some excellent photographs of these Runways bear testimony to the flexibility and handiness of the system employed.

The Morris Runway is shown in the Warehouse, Paper Mill and Foundry, and the modification of the equipment to suit varying conditions is shown in a very interesting way.

R. S. Ward, of the Beaver Board Companies, who have a plant in operation at Ottawa and are completing another plant at Thorold, has sailed for South America, where beaver board is being used with great success throughout the Colonies. Mr. Ward will not only establish new agencies, but will work with others handling the product. A former salesman for the company, he lately sold his jobbing business in Detroit to take up the new work.

BRITISH TRADE NEWS

SPECIAL TO PULP & PAPER MAGAZINE

London, February 4, 1914.

Recently a good many paper mills have been changing hands in England and Scotland. Some have failed, others have been sold to men engaged in other industries, and now it is stated that an old-established mill in the vicinity of Jarrow is to be closed down. If this is the case, 200 hands will be thrown idle. It is hoped an effort will be made to save the mill and keep it running. No reason is given for the suggested closing down.

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SURPLUS INVESTMENTS.

Frequently comment has been made in the "Pulp and Paper Magazine" of the benefits British paper mills derive in cases where the owners invest surplus cash in other progressive industrial concerns. An example is set us by the Ramsbottom Paper Mill Company, who run a mill not far from Bury in Lancashire. This company has not paid less than 10 per cent for the last 12 years, and now it is paying 20 per cent. for the third successive year. It is curious to note, however, that the actual trading profit in 1913 was less than half the amount received in dividends upon investments, the respective amounts being £4,223 and £9,745. The company has had the good fortune to invest £54,000 in shares of the Kellner-Partington Paper Pulp Company, which are now worth £170,437, and is holding in the Edward Partington Pulp and Paper Company a large interest which brought in £577 in 1913. These are facts which Canadian mill owners might consider and profit thereby. The company's own trading profit, however, has fallen nearly £5,300—the latter half of 1913 being a wretched time for British paper mills—and the dividend has been maintained by taking £1,373 from the balance forward. Here is the company's position for the past three years (note investments):—

	1911.	1912.	1913.
Trading profits.	£8,543	£9,518	£4,223
From Investments	9,000	9,000	9,746
Brought Forward	7,944	9,055	12,231
Available Money	25,397	27,573	26,200
Preference Dividend	2,542	2,542	2,542
Ordinary Dividend	10,800	10,800	10,800
Depreciation	2,000	2,000	2,000
Reserve Fund	1,000	. . . .	. . . .
Carried Forward	9,055	12,231	10,858

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F. MOSELEY.

Mr. F. Moseley, the president of Charles Marsden & Sans, Ltd., the well-known British paper mill owners, has served his firm for 50 years, during which period he states that many changes have taken place in industry. Originally he was a mill hand, and from his minor and unimportant position he has worked himself up to the presidency of the company—a position he now fills with the confidence and respect on the part of his fellow directors and every employee in the firm. As a mark of appreciation, Mr. F. E. Becker, the well-known pulp importer, has presented Mr. Mosely, on behalf of the directors, with three silver-gilt epergnes. The presentation took place in Sheffield, and Mr. Becker in a very able speech laid stress on Mr. Moseley's loyalty to his firm and the high opinions the late Mr. James Marsden had of him. A more happier selection of a person to make the presentation than Mr. Becker could not have been made, because Mr. Becker was one of Mr. James Marsden's closest friends, and he was, therefore, in a position to voice the feelings of all concerned in making the presentation. The largest of the epergnes bears the inscription: "From mill lad to chairman, Messrs. Charles Marsden & Sons, Ltd. 1863—1913." Mr. Moseley is a magistrate, and has a large circle of friends inside and outside of the paper industry. He well remembers the day when paper could not be bought under 12 cents a pound.

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WALMSLEYS START NEW MACHINE.

The well-known firm of Messrs. Charles Walmsley & Co., Ltd., papermakers' engineers, Bury, have just started up a 126-in papermaking machine at the Donside Mill, near Aberdeen, Scotland. The machine has been built for turning out newsprint and reports to hand show that everything has given complete satisfaction. Good class printings are also turned out at this mill, and it is in the fortunate position of having the order book well-filled so that the machinery will be kept running at full capacity for some months ahaed. There is talk of a new paper mill being built at Northfleet, a short distance from the Imperial paper mills. This new concern will have good facilities in the way of transport, and raw materials can be unshipped right at the mill door. The Imperial Paper Mills, which are at Gravesend (near the mouth of the river Thames) has eight papermaking machines running daily and the directors intend putting in more. They have now five calenders working, automatic water softeners and various other kinds of up-to-date machinery. Indeed, most of the paper mills now in England have been brought well up-to-date, or, are being brought, and a notable feature is the introduction of electricity. The Culter paper mills have an electric railway which penetrates into the buildings, as well as being outside, and naturally the transporting of paper and raw materials is carried out very quickly.

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NEWCASTLE-ON-TYNE.

Judging by the particulars obtained at the Newcastle-on-Tyne dock, the past year has been a very successful one all round for this important centre of industry. Wood pulp is landed at this dock from Scandinavia and even Germany, and there are also supplies of esparto received from various sources. The happy state of affairs on the Tyne is due to the big trade "boom" but it has also been promoted by the entire absence of industrial disputes, which in 1912 hampered business operations to a very serious extent. Wood pulp in 1913 was imported to the extent of 35,014 tons, an increase of 10,432 tons, while esparto amounted to 4,655 tons, a decrease of 797 tons. The quan- history of the dock, though the business in this raw tities of wood pulp received constitute a record in the material has been steadily increasing for many years. In 1891, for instance, the quantity imported was only 523 tons and in 1900 it had reached the total of 8,229 tons. Five years later the figures increased to 10,715 tons, while last year the enormous quantity of

35,014 tons were brought to the dock. These figures show the growing demand there is for pulps in the Lancashire and North of England districts, and these are facts that Canadians should not overlook. Preston is also a rising port, good supplies of pulp arrive here from Nova Scotia amongst other places. Some uneasiness was caused recently at Preston by the steamer "Helen" being 8 days overdue. She had a cargo of wood pulp from Nova Scotia, but rough weather at sea delayed her on the voyage, and she eventually arrived safely.

* * * *

CHINA CLAY.

The harassing experience which producers of China clay in England have had during the strike last year has prompted employers to come to some sort of an arrangement with their workers to prevent another stoppage of work. With this view the West of England and Great Beam China Clay Co., Ltd., have signed an agreement, along with representatives of the Workers Union, whereby all grieviences are rectified and it is also stated, according to the last clause, that "This agreement shall continue in force from February 1914 to February 1917. During this period there shall be no stoppage of work either of a partial or general character, but in the event of any question arising, the representatives of the company and of the society shall endeavour to affect a settlement. Failing a settlement the question shall be referred to the arbitration of the Trade Board, and any decision arrived at shall be retrospective, and such decision shall be final and binding on both parties." This is considered an excellent clause, as it affords protection for both masters and men. It is stated that members of the Workers' Union, non-members of the union, and the employers themselves, are well pleased with the terms of the agreement, so that so far as the West of England and Great Beam China Clay Company—one of the largest employers in the industry—are concerned there will be no difficulty during the next three years in supplying Canada and the States with the necessary paper filling. The agreement also gives one an idea as to the way to avoid strikes.

PARCELS POST.

(Special to Pulp and Paper Magazine.)

Ottawa, February 12.

Rates and regulations for the Canadian parcels post have been announced and have been greeted with a great deal of interest by the pulp and paper trade, upon which the commencement of the new system of transportation of parcels to-day, will have an appreciable effect. The rates of postage will be as follows: Within a radius of twenty miles from the place of mailing, 5 cents for the first pound and 1 cent for each additional pound up to four pounds, and 2 cents for each subsequent pound up to eleven pounds.

Within provincial boundaries outside the twenty mile zone, 10 cents for the first pound and 4 cents for each subsequent pound.

From one province to another, 10 cents for the first pound and 6 cents for each additional pound, with an additional charge of 2 cents a pound for each province which has to be crossed to the destination of the parcel, up to a maximum of 12 cents per pound.

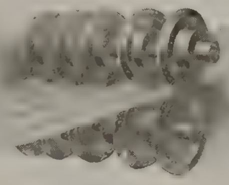
Besides its results in providing a cheaper method of transportation, the parcels post will provide an additional demand for pulp products in the form of suitable containers for eggs, butter and the like, which are expected to be sent through the mails in large quantities.

Slitting and Rewinding

Cameron Machine Co.

The slitting and rewinding of paper is a process which increases in difficulty in proportion as the requirements call for clean, accurate slitting, coupled with firm, even rewinding. First-class work has become a prime necessity, owing to the enormous quantities of roll paper now used in automatic wrapping machines, computing and recording machines, continuous printing, electrical insulation, and a hundred and one new processes arising almost daily. The defects of the machines familiar to practical men for a generation, are serious defects, and can be avoided only by a radical change in the design.

A moment's thought will show that the problem of the best way of slitting paper cannot be solved without keeping in mind the fact that it must be rewound at the same time that it is slit. In short, the two operations of slitting and rewinding are interdependent, and really constitute one continuous operation. It would seem that this fact was so clear, it need not be stated here, yet machine designers are apt to overlook it.

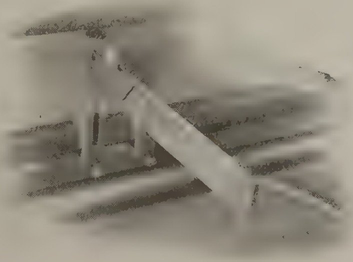


Shear Cut.

Broadly speaking, the older style machines have followed one and the same slitting method—the rotary shear, worked up in one form or another, and the results have been far from satisfactory.

This interrelation of the two operations of slitting and rewinding is described in an interesting way in the patents covering the Cameron machine, the latest of which is dated October 21, 1913, which is quoted in part as follows:—

"The problem of slitting paper has formerly been considered as being distinct from the problem of rewinding it. In other words, it has not been realized that it is necessary to have a particular kind of rewinding device in order to effect proper slitting of the material, nor has it been understood that in order to rewind the slit sections properly, it is necessary to have a particular kind of slitting device. Yet, the two problems are, in fact, interdependent and really constitute one unitary problem. Thus, if the rotary shears are used for slitting the paper, the shearing action necessarily displaces the edges of the material. The shears



Cutter complete with adjustable spacer, showing also a spacer without cutter.

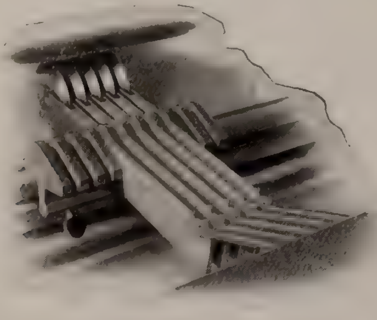
overlap each other and the paper must be pushed aside and stretch somewhat at the point where the shearing takes place. When it is attempted to rewind the slit sections which have thus been distorted it is found that the rewinding device will operate inefficiently, because in rewinding, the sections are apt to overlap or interweave, instead of being entirely separate coils. The foregoing will also result in building the coils much higher at the points where they interweave than at other points and will thereby throw the rewinding device out of proper operation.

"It is found therefore that only by combining a particular kind of slitting device with a particular kind of rewinding device can the proper result be obtained. For the slitting device, a score cutter (as described later) is most suitable. The score cutter, unlike the rotary shear, does not stretch or distort the slit section of the paper. By this improved device, the slitting process is accomplished in a way which leave the edges of the paper slit perfectly even and smooth and lying side by side without possibility of stretch or distortion, so that the rewinding may be effected without overlapping or interweaving.

"The cutting discs which thus sever the paper, act under a yielding spring pressure against the smooth and glass hard surface of the cutter roll. The edge of the disc need not be acutely sharp, but is preferably slightly blunt, like the edge of a cold chisel, while the quality and temper of the steel from which the discs are made is such as to insure the maximum of hardness and toughness without brittleness. The pressure of the discs against the cutter roll may be varied to suit the work.

The cutter roll against which the cutting discs act in severing the paper has a smooth, hard surface, which resists the effect of the cutters and prevents them from marring it with grooves. The surface of the cutter roll is preferably made up of several hollow sections or shells mounted on a centre core shaft. By this method a surface of flawless harness and smoothness is obtained. The ends of the sections are accurately ground, so that the joints between them need not be considered in respacing the cutters.

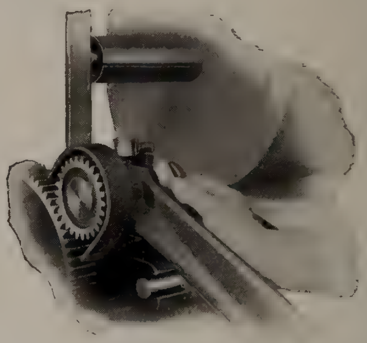
"The rewinding mechanism consists of a pair of supporting rolls, of which the cutter roll is one, together with a pressure roll, which rides upon the upper surface of the coils and holds them in uniform contact with the support rolls. The support rolls are spaced quite close together and rotate in the same direction, so that the coils resting upon them will be caused to rotate at uniform speed by surface contact. The coils are all wound upon the same arbor, but this arbor, if desired, may carry spools or cores for the reception of the coils."



Cutters mounted in Gang Spacing Block. These blocks are made in sections 6½ inches long, slotted for any spacing required. A rapid method of respacing.

The pressure roll is so mounted as to be always exactly parallel with the support rolls, so as to keep the coils of uniform diameter with respect to each other.

For the purpose of more firmly coiling the strips this pressure roll is rotated at somewhat greater surface speed than the supporting rolls, and in order to permit of adjustment a friction clutch is interposed in the line of gearing so that the speed may be varied.



Resharpening Attachment, operator can put cutters in prime shape with little trouble.

The pressure of the roll bearing upon the coils may also be regulated.

From the foregoing, it will be evident that as the web of material comes between the cutter roll and the cutter discs, it will be severed into strips of the desired width without distorting the strips with respect to each other, and that the strips by reason of this non-distorting action of the cutters will then pass on to the rewinding mechanism in true side by side relation without any overlapping or interweaving. The rewinding mechanism thus receives the cut strips in true side by side relation and is capable of rewinding them into coils of uniform diameter which will readily separate from each other on being removed from the machine.

ADVANCE IN ROSIN PRICES.

The depression consequent to the process of the disintegration and readjustment of a monopolistic naval stores trust seems to have spent its force in the rosin market. This view is based on the fact that prices for the different grades of rosins have shown slow but persistent strength since last October. Red rosins, which commanded $8.00 a barrel a few years ago, could be bought as low as $3.90 last fall, while an average drop of $2.00 to $3.00 was occasioned in all of the higher gradings. The long decline and the uncertainty surrounding the market naturally called for conservatism on the part of consumers and during the greater part of last year the demand was quiet with buyers restricting operations to actual wants. Since the turn of the year, there has been some quickening to the volume of trade at Savannah. Exporters are interested in the primary market and recent heavy purchases are taken as a reflection of their belief in the intrinsic worth of the product.

It is of interest to note the restoration of normal trade conditions after the demoralization of 1913. In addition to a production in excess of actual needs, the market was forced to submit to the unloading of some 450,000 barrels representing an approximate value of $4,500,000 accumulated by the American Naval Stores Company. The difficulties that overtook the company in the suits brought against it under the Sherman anti-trust act were increased by its financial obligations incurred in swinging the market, and further entanglement ensued in the stringency of the money market.

Notwithstanding that the Supreme Court of the U.S. had reversed the decision of the lower court, voluntary liquidation became necessary. In consequence of the breaking up of the big company as it existed three years ago, a number of independent corporations have sprung into existence and the ranks of the wholesale trade, accordingly, have been greatly enlarged.

The increase in the number of distributors is the real cause for the healthier hue which surrounds the market at present. It now seems assured that in dull times there will be spirited competition among the factors. At present it should be recalled, however, that the market has been put to a very severe test, prices have shown an abnormal decline and stocks have gradually passed from weak into strong hands. Factor's opinions convey the idea that they have the situation well in hand and will see to it that the production next season will be largely reduced. The policy of the larger factors will be, "Not a dollar for cutting boxes, buying cups, purchasing timber or leasing old boxes." The effect: A scarcity of the finer grades and of the very low grades another season.

The approximate receipts of rosin in barrels at all ports for the years named were:

1901-2	2,200,000
1902-3	2,180,000
1903-4	2,000,000
1904-5	2,100,000
1905-6	2,000,000
1906-7	2,150,000
1907-8	2,100,000
1908-9	2,250,000
1909-10	1,900,000
1910-11	1,750,000
1911-12	2,100,000
1912-13	2,250,000

To these figures should be added the rosin moved from points of production direct to the West, which is lighter proportionately than the corresponding movement of spirits of turpentine. This is demonstrated by the number of barrels of rosin handled at the ports as compared to the number of barrels of spirits of turpentine. The ratio of production is about 3.45 round barrels of rosin to one barrel of spirits of turpentine. Whereas the rosin (taking last season as a basis) handled at the ports was about 3.88 round barrels to one barrel of turpentine.

Visible stocks at Savannah at present are 161,692 barrels compared with 133,597 barrels at this time last year. Shipments so far this season are 499,466 barrels against 634,645 barrels for the corresponding period of the previous year. The new producing season will not become active before April, domestic consumers are not carrying heavy stocks and the market appears to be in a condition to respond to any increased inquiry which may develop.—Paper Trade Journal.

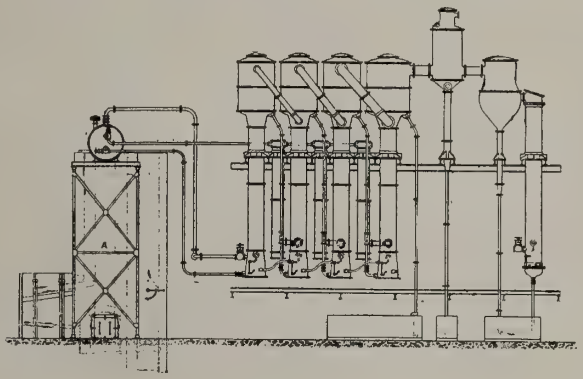
A meeting of the bondholders of the Ouiatchouan Falls Paper Company will be held in the office of the Royal Trust Co., at Montreal, on February 27th. It is understood that the meeting has been called for the purpose of authorizing the transfer of the latter company to the Chicoutimi Pulp and Paper Company, who already own a controlling interest in the company.

KESTNER DIRECT FIRED EVAPORATOR FOR CAUSTIC SODA.

The economical concentration of caustic soda liquors is one of the most important problems in the chemical industry. In some works it is still effected by steam coils placed in tanks, though in most it is done in multiple effect evaporators, the steam for heating these evaporators being taken from steam boilers.

Several attempts have been made to concentrate caustic liquor direct in boilers of the Lancashire or similar type, but experience has shown that it is impossible to keep the joints tight, as caustic will gradually find its way through almost any rivited joints in such conditions.

The problem has been completely solved by the Kestner patent direct fired evaporator, which is shown at A in Fig. 1. The chief features in the construction of the evaporator are: That the upper and lower drums are arranged so that there are no rivited joints in the plates; the form and arrangement of the tubes is in accordance with the Kestner patents, and this arrangement is such that perfect circulation takes place; the return tubes being free from direct fire heat.



This evaporator has been at work in conjunction with the ordinary type evaporator working under the following conditions. The thin caustic liquor at 20 deg. Tw. is taken through a heater and then into the Kestner evaporator. The density is raised up to 40 deg. Tw. and vapour generated at 60 lb. pressure. The vapour is used to heat a double-effect pan of the ordinary type.

In tests made on this direct fired evaporator 8½ lb. of water were evaporated per pound of fuel, Lancashire coal being used. It is unnecessary to elaborate such figures, as they speak for themselves.

While the Kestner direct fired evaporator can be applied to existing installations in this way, the ideal plant is shown in the diagram. In these plants the Kestner is arranged as the first effect and followed by a triple or quadruple effect Kestner standard climbing film type.

A series of heaters is provided to heat the liquors before entering the first effect or boiler. This plant takes the liquor at, say 20 deg. Tw., and concentrates up to 100 deg. Tw., thus reducing the cost of concentration to a lower figure than has ever before been realized.

There is no doubt that this direct fired evaporator will be the means of reducing the cost of caustic soda concentration, while at the same time it has a further advantage, when there is a shortage of steam in existing plants, of relieving the boilers from supplying steam to the evaporators. Altogether, it is a notable advance on present-day practice.

UNITED STATES NOTES

Peter Thom, who has been with the Kimberly-Clark Company, at Neenah, Wis., for 31 years and most of that period general superintendent, has resigned, announcement of which was announced on February 1. The resignation of Mr. Thom as general superintendent does not mean that he severs his connection with the company, but simply that some of the duties of his position will be shifted to younger shoulders. He will remain a member of the Board of Directors, will retain his stock in the company, and in addition will serve the company in an advisory and consulting capacity. He will have an office in the newly-equipped office building at Neenah. Mr. Thom as general superintendent will be succeeded by James C. Kimberly. There is no better known paper manufacturer in the Middle West than Peter Thom. It is said that he has a record equalled perhaps by none other in this country for turning out paper mill superintendents and expert machine operators. Several years ago Mr. Thom slipped, and in the fall sustained an injury to a hip. From this he has never thoroughly recovered. Because of advancing years and on account of the trouble given him by his injured hip, he has for some time sought to be relieved of the arduous duties of general superintendent of a string of mills as those owned by the Kimberly-Clark Company.

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The annual meeting of the Eastern-Straw Board Company was held February 2 at Versailes, Conn., and the following officers were elected: Thomas F. Garvan, president; John S. Garvan, vice-president; A. J. Straw, secretary; Wm. Foulds, treasurer; E. A. Lydall, assistant treasurer, and W. E. Lydall, superintendent. In an interview with the Paper Trade Journal Tuesday, one of the officers stated that this mill is running full time, and has plenty of orders, There is to be an increase in the number of dryers, which will materially increase the production.

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The annual meeting of the King Paper Company was held last week at Kalamazoo, Mich., and reports show that the company during the past year experienced exceptionally good business, although the year was not up to the standard in a business way. The officers and board of directors were re-elected for the ensuing year as follows: A. L. Pratt, president and manager; John F. King, vice-president and superintendent; George Davis, treasurer; H. B. Colman, secretary. The company is capitalized at $1,000,000.

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Frank L. Moore, President of the Newton Falls Paper Company of Watertown, N.Y., was in the Adirondacks last week, where his company is carrying on extensive lumbering operations this winter. About 30,000 cords of pulp wood are being cut about the Cranberry. Lake region and about 20,00 cords in the West Oswegatchie region. From one-half to two-thirds of the wood to be cut is now on the lakes and rivers ready to be floated to the mills as soon as the spring freshets come. If the present weather continues, lumbering operations can be carried on without interruption for some time. The log roads have been in excellent condition this winter, and there has not been too much snow.

The annual meetings of the various companies of the Remington-Martin group of paper mills in this section were held in the offices of the company in last week when the officers and directors for the year were elected, and the annual report presented. The reports of Francis M. Hugo, treasurer, and Robert H. Buck, secretary, concerning the business of the companies during the past year showed that the business had been very good. Two changes were made in the official status of the companies. John A. Remington, son of the late Charles H. Remington and grandson of the last Charles R. Remington, who died last fall, was elected as vice-president of the Raymondale Paper Company, and the Norwood and St. Lawrence Railroad Company. Louis Bittner, of the Manufacturers Paper Company, of New York City, which handles some of the products of the Remington Companies, was made a director of the Remington Company, to succeed the late Charles R. Remington.

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Having been interested in the paper business for many years in Northern New York, although for the past few years being in other lines of business in Carthage, John A. Hyer expects to leave for Montreal shortly where he will re-enter the paper manufacuring business, having an interest in a new paper mill that is to be built there soon. Mr. Hyer went to Carthage in the winter of 1897, and started the first two paper machines that were set up in Carthage, they being in the Carthage Tissue Paper Company's plant. He was later interested in the LeRay Paper Company, and was one of the original builders of the mill at Carthage. He was for a time the general manager of this company.

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The Interstate Commerce Commission has authorized the Ocean Steamship Company of Savannah, for itself and carriers interested in its Tariff I.C.C. No. 315, to change the description of this newsprint paper classification to read as follows: "Paper printing (calendered or machine glazed, not enamelled), in boxes, crates, rolls or bundles, carload, minimum weight 40,000 pounds." This will apply on shipments from what is known as the Eastern cities, to Savannah.

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Delegates of the Pulp, Sulphite and Paper Makers' Union and the International Paper Makers' Union of Maine and New Hampshire met at Portland, Me., several weeks ago for a regular conference. None of the officers gave out any statement, except that the meetings were harmonious, and that practically all of the changes that are to be embraced in the new schedule to be presented to the manufacturers were considered. It was learned that nothing of a drastic nature was deliberated upon, and they expect the manufacturers to look upon the new schedule, which is planned to run for several years, with favor, as it is but little different from the one now in force.

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Due to the destruction of the beater house by fire, the manufacturing plant of the Munising Paper Company at Munising, Mich., is rebuilding, probably will require 60 days. The damage is estimated at $40,00. The fire at the plant was the second within a week.

The coal shed was destroyed on the first occasion, with a loss of $15,000. The mill manufactures manila wrapping paper.

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About 400 New York stationers and their wives dined on Feb. 2 at Delmonico's New York, making the close of the ninth year of the New York Stationers' Association. President H. W. Rogers made a brief address relating to the welfare of the association and introduced George M. Courts of Dallas, Tex., president of the National Association, who made reference interestingly to trade maters of national scope. Among those present were: William H. Brooks of Philadelphia, G. E. Damond of Boston, Charles E. Falconer of Baltimore, Mr. and Mrs. R. S. Bauer of Lynn, Mass., Millington Lockwood of Buffalo, Mr. and Mrs. E. E. Huber and Mr. and Mrs. F. D. Waterman.

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Francis H. Dewey, president of the Mechanics National Bank of Worcester, Mass., who was appointed receiver for the Farley Paper Co. of Wendell, on Nov. 18, by Judge Dodge in the U.S. District Court, filed his first report on the affairs of the company on Feb. 2. He sets forth that the firm owes $106,000 and has assets of $57,531. The assets consist of real estate valued at $40,460, stock on hand $9,000, accounts receivable $7,161.50, and cash on hand $1,809.97.

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Paper box manufacturers are prosperous and jubilant. Practically all of the 300 delegates present at the opening session of the Western Paper Box Manufacturers' Association convention at the Hotel Wisconsin, on January 28, agreed that the industry has never seen such a good year as the one just past. They expressed the sentiment freely. Public demand for the sanitary packing of edible manufacturers has done more to increase the demand for paper boxes than the 3,000 makers in the United States and Canada could have done by the most extensive advertising campaign imiginable,'' declared one delegate. ''The cracker men started in putting biscuits in pound packages,'' said Egbert B. Hoy, editor of the American Box Maker. ''Now butter as well comes in paper cartons, and a thousand and one other solids which can be dry packed are put up in paper boxes to insure their sanitary condition when they reach the consumer.

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A hearing on the foreclosure suit brought against the Paper Box Company will be held before Judge John H. Kirkham in New Britain, Conn., March 3. Deputy Sheriff Harlan B. Morton is acting as keeper of the plant.

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The Edward Balf Company of Hartford, has filed a certificate increasing its capital stock to $241,900 by the issue of 338 shares at a par value of $100, subscribed by Maurice B. Welch, Edward Balf and Lucius B. Barbour, of Hartford. The Waterbury Paper Box Company of Waterbury, Conn., has increased its capital stock from $25,000 to $50,000 by the issue of 250 shares at a par value of $100. The certificate is subscribed by Harry A. Heminway, Merritt Heminway and William H. Beers, a majority of the directors.

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Theodore M. Byxbie, receiver of the defunct Capitol Manufacturing Company, makers of paper boxes in Hartford, Conn., reported to the Superior Court that the business was stopped last March and the assets sold in piece meal for $1,145.52. Wage claims have been paid, and the receiver has $806.23 on hand. No claims have been disallowed and $7,652.83 of general claims have been allowed. The report was presented by Anson T. McCook, the receiver's attorney, and accepted by Judge Greene.

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The annual dinner of the superintendent and forcement of the New England Box Company was held at the Mansion House Boston, Mass., on Feb. 1. There were 45 present. B. W. Porter, president of the company, after a short address, called upon E. D. Chase, of Charlestown, N. H. E. A. Shepardson of Baldwinsville, and W. M .Baker, of Greenfield for addresses.

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A work of development and installation of more improved facilities for the manufacture of paper at the plant of the Schmidt-Ault Paper Company at York, Pa., has shown considerable progress since last year. Additional paper making machinery is being installed and with the increased capacity the company will double its output. Its product will amount to 40 or 50 tons daily, or an average of about three carloads of wrapping, building carpet lining and other grades of paper. The first step of improvement has been the erection of a machine room, 260 feet by 80 feet in dimensions, of brick, steel and concrete construction. The building is fireproof throughout, having a concrete floor and a roof of slow burning material. It is more than several times the size of the old machine room, and has all conveniences for the employes, being well lighted and ventilated. Hundreds of windows face the north, south and east sides of the building.

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One of the oldest paper houses in Baltimore, Md., passed out of existence when the Whitaker Paper Company of Cincinnati, O., purchased the Smith Dixon Company, Incorporated. Under the law, the business of the Baltimore Company will be conducted for a year under the present management, and will then go into the control of the Whitaker Company. It will be known as the Smith Dixon Company Division. The Smith Dixon Company was organized about 1866. Advices from Cincinnati state that the Whitaker Paper Co. proposes to increase its capital stock from $500,000 to $1,000,000 to take care of new enterprises. Directors have approved the plan which will be submitted Feb. 27 to stockholders for ratification.

INTERNATIONAL PAPER CO.

(Special to The Pulp & Paper Magazine.)

New York City, February 13, 1914.

The International Paper Company, whose executive offices are at 30 Broad Street, this city, will issue its report for the year ended December 31, 1913, within the next few days. According to advices from officials of the company it is not expected that any changes of consequence will be shown, as compared with the preceding year. There was no material change in gross earnings and the surplus available for dividends showed a slight reduction from the 1912 figures, which showed a balance available for dividends of $1,187,678, equivalent to 5.34 per cent on the $22,406,700 preferred stock.

While net earnings will not be quite so large as in 1912, it is stated that the company's financial position has been improved considerably. During the past twelve months the company has retired a considerable amount of debt, has made large expenditures in the building of dams, etc., and has charged off liberally for depreciation. Philip T. Dodge, president of the company is working strenuously to entrench the company in a strong financial position. His past success in this direction with the Mergenthaler Linotype Co., is well known.

The placing of newsprint on the free list under the new tariff law has not resulted in any material reduction in newsprint prices by the International Paper Co. Most of its newsprint contracts run for one year, and contracts recently closed have been at approximately the same figures as for the previous year.

International Paper Co. estimates that the consumption of newsprint in the United States and Canada last year was between 7 per cent. and 7½ per cent. in excess of that for 1912. President Dodge figures that if all the newsprint mills in the United States and Canada were to run at full capacity under normal conditions, the total production would be only 6 per cent. or 7 per cent. in excess of the total consumption.

The Beaver Company at Thorold

Toronto, February 13,

To complete a half million dollar plant within a year from the turning of the first sod is certainly accomplishing something out of the ordinary, yet this is what is being done at Thorold, Ontario, where the Beaver Companies, Buffalo, are rushing the installation of machinery in the second factory which they have built in Canada, the other being at Ottawa. Last month the annual sales convention of the Beaver Board Companies was held at Buffalo and occasion was taken by the party of seventy delegates to pay a visit to the plant at Thorold. The visitors were delighted with the progress of the work and watched with keen interest the installation of the huge dryers on the wood fibre machine which is the largest of its kind in the world, and will have an output of from sixty to seventy tons per day of beaver board made from pure wood fibre. It is rumored that the company have arranged for a large supply of rossed wood through a Quebec firm.

The new Thorold plant is an immense affair being erected of steel and concrete, of the factory type, with numerous windows on all sides and sky lights. The wood fibre machine will extend the length of the main building of the plant, the dimensions of which are 350 feet long and 150 wide, with an extension of 150 x 74 feet to the north end and another of 150 x 150 feet to the south end. There are four well equipped, up-to-date buildings in all, and the engineer in charge of construction is E. E. Whitney. The Grand Trunk Railway has a siding running down to the plant while the shipping facilities by water on the Welland Canal will be all that can be desired. The Beaver Board Companies, of which W. F. MacGlashan of Buffalo is President, and H. S. Lewis of Beaver Falls, N.Y., Vice-President, expect that the new works at Thorold will be in full operation by April next.

Victoria Paper and Twine Company

Toronto, February 2nd, 1914.

Early next month the Victoria Paper and Twine Co., Liimted, will remove into their new and splendidly fitted-up warehouse at 439-441 Wellington Street West, Toronto. It is less than four years ago that the company took possession of the present premises at 415 King Street West and for a long time these have been far too small and reserve stock had had to be stored in other buildings, which has been rather inconvenient. Last fall the directors decided to build a structure that would adequately meet their wants and the handsome "Victoria Building," by which name it will be known, is about completed. The edifice has a frontage of 50 feet on Wellington Street, and a depth of 210, and possesses four floors. The timbers used are the largest ever brought into Toronto for a mill constructed, stone and brick warehouse building. The floors are of Georgia pine and maple, being five inches thick.

The offices on the first floor are finished in modern style. There are departments for the selling, accounting and other branches as well as the officers of the company, and finely equipped sample rooms. The private apartments are nicely arranged and a private telephone exchange and pneumatic tubes for sending orders to the shipping room will also be one of the features. The warehouse itself is of the latest type of construction, and made to stand the heavy strain necessitated by the large stocks carried. The plans were drawn up so as to give the best possible stock piling advantages and economies and afford the best shipping facilities. A railway siding will be built to the rear of the building for receiving and despatching car load quantities while smaller shipments will be made from the front of the building, where large steel rolling shipping doors are installed. Other facilities consist of two large freight elevators, modern warehouse trucks and revolvators.

Part of the structure will be used for manufacturing purposes, as the Victoria Paper Goods Company (which is the manufacturing end of the Victoria Paper and Twine Co.) will remove from 80 Colborne Street to the new warehouse.

The officers of the Victoria Paper and Twine Co. are: President, Charles F. Hubbs; First Vice-President, Wm. H. Howe; Second Vice-President, R. W. Gallagher; Treasurer, H. J. Severance; Manager and Secretary, Charles V. Syrett; Directors, Charles S. Nicholls and L. E. Charles. The business of the company extends all over Canada, and the directors look forward to even larger operations in their new quarters, which will afford improved service and enable the company to handle a wider range of unique and serviceable paper commodities. The management is composed of capable energetic salesmen, and the outlook for the coming year is regarded as of the most promising character.

TRADE ASSOCIATION IN NEW YORK.

(Special to Pulp and Paper Magazine.)

New York, N.Y., February 12, 1914.

February is the month of conventions and banquets in this city in the paper and stationery trades. The week beginning February 16 the time set for four such gatherings. The National Paper Trade Association starts its annual meeting on Monday, February 16 and closes on Wednesday the eighteenth with a banquet and vaudeville show at the Waldork-Astoria Hotel. Ladies are most cordially invited to attend this affair. On the same night as this association's banquet are two others. The Associated Dealers in Paper Mill Supplies of New York will dine at the Hotel McAlpin and the Stationers' and Publishers' Board of Trade will meet at the Hotel Plaza.

Wednesday and Thursday, February 18 and 19, are the days on which the thirty-seventh annual meeting and banquet of the American Paper and Pulp Association will take place at the Waldorf-Astoria Hotel. The first of these days will be devoted to the various divisional meetings which will take action upon any changes or trade customs. The next day will be devoted to a general meeting, when all divisions will report, and their action on any trade customs will be ratified and confirmed. Their will follow the election of officers and lectures and addresses on subjects of interest and importance to the trade. In the evening, the annual banquet will take place in the Grand Ballroom.

MacLAREN'S CASE.

(Special to Pulp and Paper Magazine.)

Ottawa, February 12.

One of the most important cases as affecting the interests of lumber, pulp and paper companies, which has been decided for some time was that of the MacLarens Company of Quebec versus the Attorney-General of that province. The case has caused a great deal of interest locally, as its outcome affects titles on the Gatineau and all other rivers of the same character flowing into the Ottawa River from the North. It arose out of a dispute over rights to the bed of the Gatineau at Paugan Chutes betwen the MacLarens and Hanson Brothers, of Montreal, and the Attorney-General of Quebec. The MacLaren Company are riparian owners; Hanson Brothers were granted water power privileges on the Gatineau and the Attorney-General comes into the case owing to his intervention on behalf of the latter firm to maintain the title which was given them in 1899. The MacLaren Company wins out as a result of the judgment, and is declared to own the entire bed of the river. The effect of the judgment, therefore, is that in rivers which are not navigable and do not allow the floating down of cribs of timber, owners of land bounded by the river bank own to the middle of the stream. People who own the banks on both sides own the entire bed of the river, although rights as regards the floating of timber and other such purposes are reserved in favor of the general public.

PULP AND PAPER NEWS

It is reported that a new box factory will shortly be established in Owen Sound and the promoters have been looking over several sites with a view to building there this spring.

A signal honor has been conferred upon Dr. B. E. Fernow, dean of the School of Forestry, Toronto, in being made President of the Society of American Foresters, which is the only organization of professional foresters in the western hemisphere.

The Montreal Engineering Company, Ltd., has retained Mr. Herbert S. Kimball, pulp and paper mill engineer of Boston, as consulting engineer in connection with one or two large paper mill projects which it is understood will be launched in the near future.

Robert Barber, formerly sales manager for William Barber and Bros., and for some time with the Barber Paper and Coating Mills C., Limited, of Georgetown, has been appointed city sales agent for the Fred W. Halls Paper Co., of Toronto, and has entered upon his new duties. He is widely known in the trade.

It is understood that the Austin Paper Co. of Winnipeg, at the head of which is L. N. Austin, are having plans prepared by the Albertson Engineering Co. of Kalamazoo, Mich., and Toronto, for the erection of a board mill which will use flax straw for the making of board, and that construction will go ahead this spring.

The British American Wax Paper Co. of Toronto, of which H. B. Hart is manager, has, during the past few weeks, increased its facilities by fifty per cent by taking in a large portion of another floor in the Darling Building. Three machines for waxing paper are kept constantly in operation. The demand among bakers for waxed paper for bread wrapping is constantly increasing, and the outlook for the present year is reassuring.

The Bishopric Wall Board Company, of Ottawa, are in the market for 1,500 tons per year at least, of a rosin-sized chipboard 49¼ in. wide, put up in rolls not over 45 in. in diameter. Paper to Caliper 40 to 45 points, and stand a mullin test of at least 80. It should be waterproof and machine finished. It could be delivered at the rate of about 125 tons per month, starting the first of May.

The Welland Lumber Co., Limited, has been granted a charter with a share capital of $100,000 and head offices in Welland. The company is empowered to carry on the business of timber merchants, saw mill proprietors, timber growers, etc., and to purchase and deal in timber limits and concessions. The incorporators are J. W. Rounding, Frank Edwards, George E. Tufts, George W. Hodgson and Ernest R. Tewsley, all of Welland.

The Provincial Paper Mills Co., Limited, with plants at Mille Roches, Thorold, and Georgetown, Ontario, will hold their annual meeting on February 18. The company, who have their general offices on the third floor of the Bell Telephone Building, Toronto, will shortly remove into larger quarters in the same building, taking over the offices at present occupied by the Toronto Harbor Commissioners on the same flat.

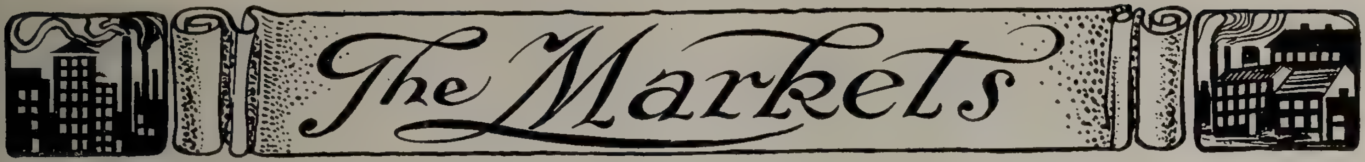
F. A. Ritchie of the firm of Ritchie and Ramsay, Limited, New Toronto, and Robert L. Patterson, manager of Miller and Richards, type founders, Toronto, left this week to spend a couple of months among islands of the West Indies.

The Inland Pulp and Paper Co., of Thorold, Ont., who recently took over the plant of the Colonial Wood Products Co. in that town, and are now operating it, have secured a large contract for ground wood pulp, which will keep the mill running for six months longer. The Messrs. Eshelman are connected with the new company and under their progressive direction the outlook is bright.

W. J. Gage, President of the Kinleith Paper Mills, St. Catharines, and the W. J. Gage Co., Toronto, has made another splendid gift to the work of the National Sanitarium Association. His latest donation is one hundred thousand dollars, and the money will be used in providing for the maintenance of needy patients in connection with the work at Gravenhurst. Mr. Gage, who has for many years been a leading worker in the fight against the white plague, has made gifts toward the cause of over a quarter of a million dollars.

The annual meeting of the Kinleith Paper Mills, Limited, was held recently in Toronto, and very satisfactory reports were presented for the past year. Several improvements have been made during the past few months to the plant at St. Catharines, a large three-storey stock house being built of concrete and brick. There has been installed throughout the mills wherever possible, electric motors for running the equipment, power being obtained from the Ontario Power Company. Under the direction of the new superintendent William Anderson, late of the Milham Division of the Bryant Paper Co. of Kalamazoo, Mich., things are running smoothly. The former superintendent, A. A. Briggs, retired at the end of the year, as previously announced in the Pulp and Paper Magazine. W. J. Gage was re-elected President, W. P. Gundy, Vice-President and Managing Director; C. Stewart Patterson, Secy-Treas., and F. H. Gage sales manager.

The annual meeting of the W. J. Gage Co., manufacturing stationers, Toronto, was held recently, and the reports presented showed that the business for 1913 was ahead of that of the previous year, the directors reporting that the increase in the volume of trade east of the Great Lakes more than made up for the falling off in Western Canada. The figures show that the turnover almost reached a million dollars. All employees who have been in the service of the firm for a period of two years and over were given a bonus varying according to the length of employment and responsibility of duties, while the heads of departments are permitted to acquire stock in the company on very favourable terms. Mr. Gundy, managing director, reports that the profit-sharing plan, which was inaugurated some twelve years ago, has worked out advantageously to the benefit of the company and its employes. W. J. Gage was re-elected President; W. P. Gundy, Vice-President and General Manager; A. G. Parker, Secretary; H. H. Love, Treasurer; and H. F. E. Kent, Superintendent.



The Markets

CANADIAN MARKETS.

Toronto, February 9th.

There is no change to record in the news print situation, and prices remain firm. All the large plants are running on contract and there will not be any large renewals until April or May, when some of the present contracts expire. One outstanding feature is the large increase in shipments of print paper to the United States, the gain in 1913 being over 100 per cent over 1912. This has no doubt been brought about by the increased tonnage in Canada, which has shown an augmentation of more than 100 per cent in the last two years, and by the rescinding of clause two in the reciprocity agreement, admitting thereby all print paper under two and a half to the American market free of duty. According to a return just prepared by the Trade and Commerce Department, Ottawa for the calendar year of 1913, the total exports of paper to the United States were valued at $5,754,156, as compared with $4,221,220 in 1912. Of the total export of paper news print was the principal item, amounting to $4,242,298 in 1913 as compared with $1,989,863 in 1912.

Book and writing plants are not rushed, but business is more active for them, and the outlook is brighter. Wrapping papers are still being cut in prices and the mills are all eager after orders. Ground wood pulp demand is still quiet and unchanged. The market for sulphite is pretty firm and quotations are well maintained. The rag and paper stock situation is not very brisk in any line.

The prevailing quotations, f.o.b. Toronto, are:—

Paper.

News (rolls $1.95 to $2.00 at mill in car load lots.
News (sheet) $2.15 to $2.30, at mill in car load lots.
News (sheet) $2.35 to $2.75 at mill in less than car load lots.
Book papers (carload) No. 3, 3.75c to 4.50c.
Book papers (ton lots) No. 3, 4c to 4.50c.
Book paper (Carload) No. 2, 4.25c.
Book paper (ton lots) No. 2, 4.50c to 5c.
Book papers (carload) No. 1, 4.75c to 5.25c.
Book papers (ton lots) No. 1, 5.25c to 7.00c.
Writings, 5c to 7½c.
Sulphite Bond, 6½c to 7½c.
Grey Browns, $2.35 to $2.75.
Fibre, $3.00 to $3.75.
Manila B., $2.75 to $3.25.
Manilla No. 2, $3.00 to $3.50.
Manilla No. 1, $3.00 to $3.75.
Unglazed Kraft, $3.75 to $4.50.
Glazed Kraft, $4.00 to $5.00.

Pulp.

Ground wood (at mill), $15 to $16.
Ground wood, $22 to $24, delivered in United States.
Sulphite (unbleached), $42 to $43, delivered in Canada.
Sulphite (unbleached), $43 to $44, delivered in United States.
Sulphite (bleached), $56 to $57, delivered in Canada.
Sulphite (bleached), $58 to $59, delivered in United States.

Paper Stock.

No. 1 hard shavings, $1.87½ to $1.90.
No. 1 soft white shavings, $1.70 to $1.75.
No. 1 mixed shavings, 50c.
White blanks, 82½c to 85c.
Ordinary ledger stock, $1.20
Heavy ledger stock, $1.40 to $1.50.
No. 1 book stock, 70c.
No. 2 book stock, 45c to 50c.
No. 1 manilla envelope cuttings, $1.10 to $1.15.
No. 1 print manillas, 65c.
Folded news, 50c.
Over issues, 52½c.
No. 1 clean mixed paper, 30c.
Old white cotton, $2.50 to $2.75.
Thirds and blues, $1.30 to $1.32½.
No. 1 white shirt cuttings, $5.00 ta $5.25.
Blue overall cuttings, $3.50 to $3.60.
Black overall cuttings, $1.75.
Black linings, $1.75.
New light flannelettes, $4.50.
Ordinary satinets, 75c.
Flock, 85c to 90c.
Tailor rags, 65c.

All foregoing prices for paper stock are f.o.b., Toronto.

Quotations f.o.b. Montreal are:

Book and News Paper.

Roll News, $40 to $43 per ton for large orders; $45 to $50 per ton for small orders.
Ream News, $45 to $47 per ton for large orders; $50 to $60 per ton for small orders.
No. 1 Book, 5¼c to 6c per lb.
No. 2 Book, S.C., $4.50 to $4.75 in large quantities; $4.75 to $5.50 in small quantities.
No. 3 Book M.F., $4.00 to $4.25 in large quantities, $4.40 to $4.50 in small quantities.
Writings, 5c to 7½cc.
Sulphite Bond, 6½c to 8½c.

Most of the manufacturers are quoting 10 per cent. less than the above prices to the jobbing trade on the cheaper lines of wrapping., such as B. Man., No. 2 Man.—grey and red browns.

Wrappings.

Grey Brown, per 100 lbs., car lot s,$2.35; 5 tons $2.45; 2 tons, $2.55; 1 ton, $2.65; less, $2.75.
Red Brown, car lots, $2.85; 5 tons, $2.95; 2 tons, $3.05; 1 ton, $3.15; less, $3.25.
B. Manilla, car lots, $2.85; 5 tons, $2.95; 2 tons, $3.05; 1 ton, $3.15; less, $3.25.
No. 2 Manilla, car lots, $3.10; 5 tons, $3.20; 2 tons, $3.30; 1 ton, $3.40; less, $3.50.
No. 1 Manilla, car lots, $3.35; 5 tons, $3.45; 2 tons, $3.55; 1 ton, $3.65; less $3.75.
Kraft, $3.75 to $5.00.
Fibre, car lots, $3.35; 5 tons, $3.45; 2 tons, $3.55; 1 ton $3.65; less $3.75.

Pulp.

Sulphite easy bleaching, $43 to $45 per ton.
News quality, $41 to $42 per ton.
Bleached sulphite, $54 to $59 per ton.
Kraft pulp, $3.60 to $4.00.
Ground woods, No. 1, $15 to $16.
Ground wood, No. 2, $22 to $24, delivered United States.

NEW YORK MARKETS.

(Special to Pulp & Paper Magazine.)

Office Pulp & Paper Magazine, 206 Broadway,
New York, February 13, 1914.

Shipments on old contracts have been resumed to normal movement since the first of the year, and a few new contracts have been made. Importers here have been anticipating an increase in price, and this has been realized in instances where offers have been cabled to Scandinavia pulp mills at prices that were well within the market range, and these were rejected. Inquiries have been numerous, and are increasing, but most orders are of spot nature. There has been a good deal of hand-to-mouth buying, but this is considered to be of only temporary nature, and it is expected that when contracts are made both in bleached and unbleached sulphite, mills will find a much stiffer price than is now asked. Sulphate and Kraft pulp have been rather quiet, and in some instances, it has been found necessary to curtail the expense of storage by selling at very narrow margin or even at a loss. The outlook is bright and a stiffening in price is expected by both dealers and importers.

Inventory at the mills during the past month found rather plentiful supplies of mechanically ground wood pulp on hand, and as a result there has been little demand for this product. There is, however, a small amount of business going on at prevailing prices, and local agencies are firm in maintaining the present quotations as a somewhat shortened supply is anticipated before long. Shipments on the balances of old contracts show that there is a growing activity among paper mills and if this condition continues, it is not improbable that anticipations of the trade will be realized.

There has been a small amount of business going on in rag stock, but at very low prices. Domestic stock has been exceedingly quiet, owing to the large supplies that accumulated at the mills last summer, when they had no orders. Dealers and importers are very hopeful of the future, and expect a considerable increase in price as soon as any demand sets in. Old Bagging has been quiet for some time, but prices are well maintained. In old waste papers, soft white shavings have been in good demand, and fine in movement at $1.80. This is attributed to the active demand for book papers. Flat stock and solid ledger have also been moving freely at $1.00 to $1.05, and $1.65 to $1.75. Strictly over-issue news has been in fair inquiry at prevailing prices. A growing demand for mixed papers has been felt in the past two weeks with an advance in price from 27½ to 32½. A falling off in the demand for soft shavings is anticipated, while the freer movement in boards and wrappings bids for a better demand, and an increase in the price of mixed paper.

Paper.

The first month of 1914 was rather good in the paper business in this city, the volume transacted in that time being far ahead of the two preceding months. General tendencies are toward a bullish condition in all lines. A good deal of pessimistic talk in the latter half of 1913 spread itself to the extent of producing what might be termed a "quiet panic." The houses that were doing good business were influenced by the general atmosphere, and in spite of the fair business they did, looked on the dark side of things and shook the confidence of all. When all completed inventory, however, there was found to be a different situation in reality from what was voiced. Last year proved a very good one, when all accounts were checked. The psychological effect of this bit of knowledge, together with the completion of federal legislation that might influence trade, restored confidence and brought about a change in the tone of the market. This optimism is reflected in the entire commercial field of Nw York and paper is not inconspicuous in this. The turn of the year saw a great many orders and in two weeks the volume of business amounted to more than the whole month of December. The higher grades of writing have been in good demand, and prices have been well maintained. All new contracts for news have practically been made, and it is moving in good deliveries at 2c to 2.05c f.o.b. mill. Transient orders have been rather plentiful at 1.90c to 2.05c f.o.b. mill. There has been a somewhat shortened supply of side runs, but the condition now surrounding this line is a little easier. Manufacturers of book are several weeks behind in their deliveries, and they report no easement in the inquiry for their stock. Last year was among the best business years in that line. Tissues and Kraft have been rather quiet, but firm. Owing to the Brooks net weight and content of container law, which became effective February 1, jobbers have been trying to force out all rolls on their shelves, as the old stock did not have a guarantee of its weight or quantity as now required. This preparation left almost no activity in that line, as no orders are being placed with mills until these old stocks are cleaned up. The firmness of the tissue market was somewhat disturbed recently when certain mills, which probably had large stocks in over-production, offered No. 1 white at 40c, in car lots, rather than hold out for the market value which has been maintained at 42½c to 45c on 1,000-ream and car lots. A fair demand has been current for wrappings, which has shown a little easing in the past week, although prices are kept firm. This is thought to be only temporary, and a good many orders are anticipated in the near future.

The Board market has been a little quiet, but the total of last year's business was better than ever before. The first of February saw a change for the better and a rather hardening tendency in prices.

Quotations throughout the paper list are without a change and are repeated as follows:—

News, rolls, transient business $1.95 to $2.00 f.o.b. mill.

News, sheet, $2.10 to $2.15 f.o.b. mill.

Book papers, car lots, C. & S.S., $4.00 to $4.20 f.o.b. mill.

Book papers, car lots, M.F.S., $3.75 to $3.90 f.o.b. mill.

Writing paper, superfine, 11c to 13c del. east of Miss. River.

Writing paper, extra fine, 10½c, del. east of Miss. River.

Writing paper, No. 1, fine, 9c, del. east of Miss. River.

Writing paper, No. 2, fine, 8c, del. east of Miss. River.

Writing paper, engine sized, 4½c to 8c del. east of Miss. River.

THE BRITISH MARKETS.

(Special to The Pulp & Paper Magazine.)

London, February 3, 1914.

The dullness that prevailed in the British paper industry towards the close of the old year does not seem to have been lifted with the advent of 1914. Agents

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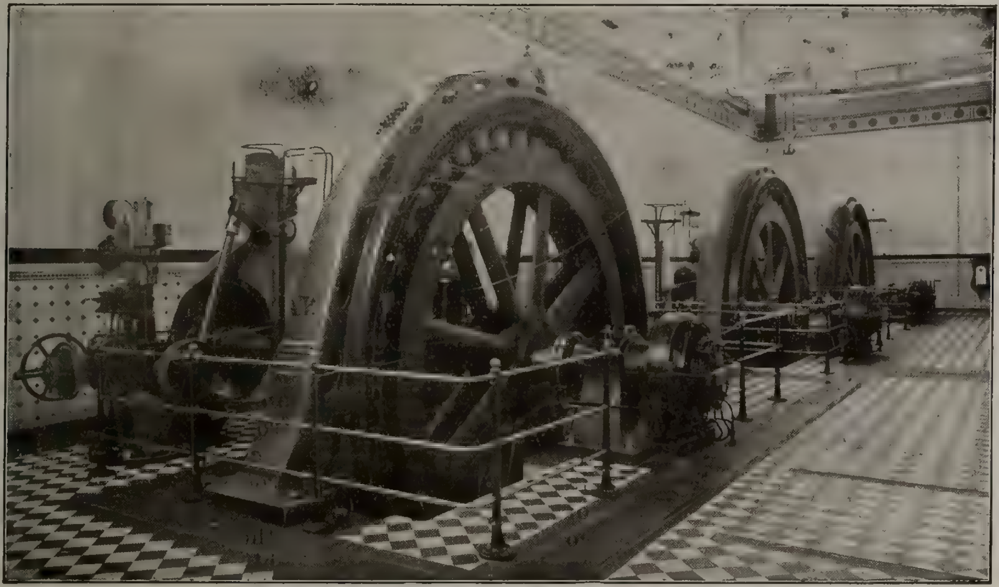

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and millowners are complaining generally of the slackness of new business, and if it was not for the contracts on hand, and the orders served out by the Government and public bodies, it is feared that the paper trade would be in a bad way. It is true that the industry is feeling the after effects of the trade "boom," and the margin of profit gained is extremely small on what little transactions that are taking place. Some mills, however, are well supplied with orders for sometime past, but there are mills which keep up a steady output all the year round, and are in the happy position of having a good standing connection with their customers. January is also a time for stock-taking amongst the millowners. High-class printings are in fair demand there is also a good outlet in the export trade for newsprint. Esparto papers are dearer, and just at the moment manufacturers of this class of paper are experiencing a crucial time, owing to the increased cost of production.

* * * *

The chemical pulp markets are in a quiet state, owing to the dullness of the paper trade, and prices at present are easier, but there is every likelihood of them becoming slightly harder or recovering themselves with a very short period. This featureless state of the market is only in common with other places, like France, Sweden and Germany, where business is said to be very bad. Norway is in trouble with the employees of the pulp mills, and if the unrest is not soon arrested, it is feared that by the end of February there may be a serious strike. This unrest has been going on for some months past, and now that a strong political element is at the back of it one never knows what to-morrow may bring. The pulp employees of Norwegian mills appear to have many grievances, and apparently they will not rest contented until they are allayed. Another fact is that since the strike in 1912, they seem to be in a restless mood and very little is said about it in either of the trade papers in Norway, Sweden, or England. A general strike, of course, means a jump in prices in London. At present, prices are c.i.f. London and other British ports:—

Bleached Sulphite	$57.60	to	$58.00
Easy Bleaching (No. 1)	41.45	to	43.20
Easy Bleaching ,strong)	36.05	to	38.40
Soda Unbleached (No. 1)	37.20	to	39.10
Soda Unbleached (strong)	36.00	to	38.00
Soda Kraft	38.40	to	39.40

These are about the prices quoted for delivery during 1914-15, but the Norwegian crisis may disturb them at any moment.

* * * *

The mechanical pulps market are very depressed and featureless, and importers report that nothing has been doing since the new year opened. Heavy shipments are arriving from Norway and Newfoundland sources. For mechanical dry the demand is practically stopped, and there is not even an enquiry reported. Prices to British ports, c.i.f., are as follows:—

Pine 50 p.c. moist (prompt)	$ 9.00	to	$11.00
Pine dry (promp)	19.15	to	20.00

For forward delivery add another half dollar.

* * * *

A very crucial outlook is reported in the Esparto trade. The supplies are limited, and prices in England have reached record figures, so that very little business can be transacted at the present levels. Those papermakers who have not a good stock of Esparto on hand will find themselves in a very tight corner. As things are at present an attempt is being made to raise the price of Esparto papers.

* * * *

There is a considerable amount of business being put through in the chemical markets. Bleaching powder is steady at $26, but spot supplies are $1 extra. Soda Ash is moving off very well. Caustic soda is quiet, and is expected to continue so for some time—70 per cent being $45 and 77 per cent $48. Ammonia Alkali is in good demand, and quoted $17.40 to $19.20, according to package. Rosin values are higher and the demand since the beginning of January has been good. Sizing is firm and unchanged in prices.

* * * *

Rags of all grades are in good request, but there is a scarcity and the new restrictions are interfering with supplies. Prices are very firm, and the same can be said of bagging, gunny and other papermaking materials under this heading.

* * * *

The position of the China Clay producers is a difficult one at the moment. The demand exceeds the supply, and stocks are extremely low. Prices have advanced slightly, and it seems that the losses sustained during the late strike cannot be overtaken. Other fillings used by papermakers are unchanged, except to those who have not contracted, small parcels being charged up at heavy rates of an unprofitable character to the paper mill owner.

SCANDINAVIAN PAPER AND WOOD PULP.

The severe frost which has continued week after week without any interruption is reducing the water in our rivers and several mills already report a reduced output from this cause. Pulp grinding is also difficult in very cold weather, with a considerable reduction of the production as a consequence. The Swedish Upper Gulf ports have been closed to navigation by ice. Under these circumstances Mechanical Wood Pulp will probably become firmer.

There has recently been a little more demand for Sulphite Cellulose. Sulphate is very firm for delivery over the current year, but the many new Sulphate mills in Sweden tend to depress the market for long contracts.

ARGENTINE PAPER INDUSTRY.

Although working under favourable conditions, the papermaking industry has not made much progress, in spite of a protective tariff and an increasing home demand. The only paper mills with any claim to importance are the Zarate factories at Campana and Vicente Lopez. These mills are worthy of mention in connection with the manufacture of a paper strong enough for use as grain bags, tarpaulins for corn sacks, etc., for which the management claim to have discovered a process. The raw material employed is the wild tacurara of the Parana river and the flax fibre.

The removal of the duty on paper is now being urged in the press, and a bill to that effect is at present before Congress.

The importation of paper is as follows:—

	Metric Tons.	
1909	18,600	£467,400
1910	34,400	623,600
1911	38,800	685,300
1912	38,300	618,900

The imports of paper for the press have risen from below 5,000 metric tons in 1900 to nearly 28,000 metric tons in 1912. In the latter year the imports include 3,160 tons of writing paper, 570 tons of cigarette paper and 830 tons of wall paper.

In connection with the fortcoming annual meeting of the Canadian Pulp and Paper Association, which will be held in Montreal on February 26th, it is understood that an effort will be made to organize a jobbers' section where problems of mutual interest may be discussed. Speaking of the need of such a section, a leading Toronto wholesale paper man said: "I am strongly in favor of such a move, as there are many matters which might be considered to good advantage. Take the question of cartage rates, for instance. I see that the paper houses in Montreal have secured a one-cent rate per hundred pounds, whereas the rate on general merchandise is three and a quarter cents per hundred. Here in Toronto we have not got together, and the result is that we have to pay three cents per hundred, the advance of a few weeks ago being one cent. Think what a difference there is between the cartage rates on paper here and in Montreal—two cents per hundred pounds. Now, not to speak of what we ship out, but referring only to the amount of paper that we get in every day—about thirty tons—the extra charge of two cents per hundred pounds on cartage means an added cost of twelve dollars per day. Figure that, for thre hundred days in the year and the sum will reach close onto four thousand dollars extra in cartage charges alone. It is likely, in the meantime, that we will bring up the matter before the Toronto Board of Trade, to see if something cannot be done to adjust conditions.

The Holden-Morgan Co., Toronto, manufacturers of bread wrapping machines, have now turned out a dozen of these machines for leading Canadian bakers, and have several other orders which will keep the firm busy for several weeks. The machine is the only one invented that will use any kind of paper, waxed or unwaxed. The foreign patents of the company are controlled by Standard Wrapping Machines, Limited, who have effected arrangements to have the outfit made for the American market in New York City. A. P. Holden, of the company, has returned from a business trip to New York.

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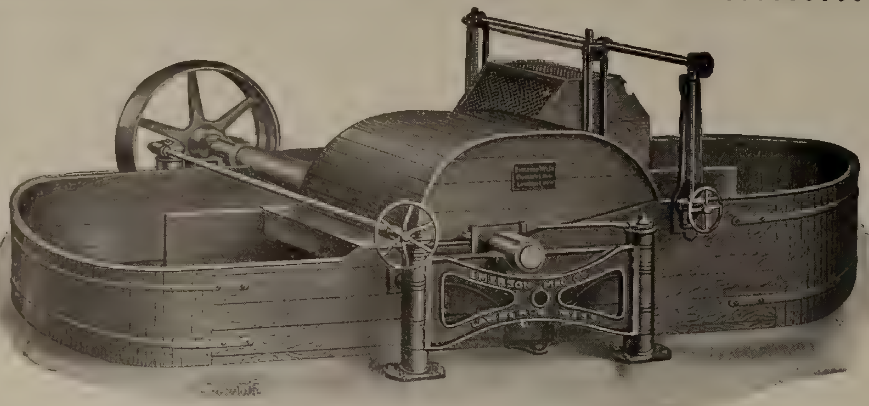

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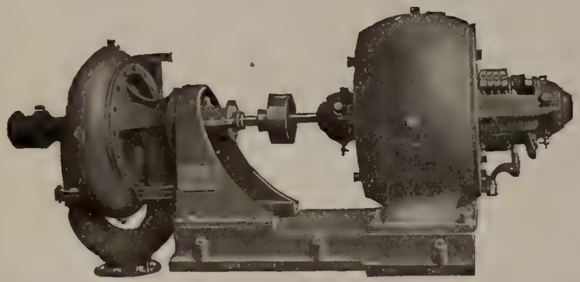

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Scott, Ernest & Co., Fall River, Mass.
Sheldons, Ltd., Galt, Can.
Sherbrooke Mach. Co., Ltd., Sherbrooke, Can.
Smith, S. Morgan, Co., York, Pa.
Stebbins Eng. & Mfg. Co., Watertown, N.Y.
Ticonderoga Machine Works, Ticonderoga, N.Y.
Valley Iron Works, Appleton, Wis.
Voith, J. M., New York, N.Y.
Voith, J. M., Wurtemberg, Germany.
Walmsley, Chas. & Co., Bury, Eng.
Waterous Engine Works Co., Ltd., Brantford, Can.
Westbye, P. P., Peterboro, Can.

Paper Machine Tachomoters
Boving & Co., of Canada, Limited, Toronto, Ont.
Schaeffer & Budenberg, Brooklyn, N.Y.

Paper Tester
Chambers Ltd., 152 Bay Street, Toronto.
Marshall. T. J. & Co., Stoke Newington, London, England.

Pneumatic Thickeners
Sherbrooke Mach. Co., Ltd , Sherbrooke, Que.

Pneumatic Chain Blocks
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Press Rolls
Bertrams Ltd., Edinburgh, Scotland.
Chambers Ltd., 152 Bay Street, Toronto.
Sherbroke Mach. Co Ltd., Sherbroke, Que.

Press Wire Cloth.
Chambers Ltd., 152 Bay Street, Toronto.
Kufferath, Andreas, Mariaweiler, Germany.

Pulp Stones
Stancliffe Estates Co., Ltd., Darley Dale, England.

Pumps
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Machine Co., Lawrence, Mass.
Glen Falls Machine Works, Glens Falls, N.Y.
Hamilton, Wm., Co., Peterboro, Can.
Lawrence Machine Co., Lawrence, Mass.
Lawrence Pump & Engine Co., Lawrence, Mass.
Smart-Turner Machine Co., Hamilton, Can.
Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
Voith, J. M., New York, N.Y.

Rags
Walker, J. R. & Co., Montreal, Can.

Recording Gauges
Schaeffer & Budenberg, Brooklyn, N.Y.

Recording Thermometers
Schaeffer & Budenberg, Brooklyn, N.Y

Refiners
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Marx, J. & Co., London, E.C., England.
Process Engineers, Ltd., Montreal, Canada.
Rice, Barton & Falls Mach. & Iron Co., Worcester, Mass.
Voith, J. M., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford, Can.

Rope Blocks
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Rosin Size
Fox, Stockell & Co., London, Eng.
Paper Makers Chemical Co., Easton, Pa.
Process Engineers, Ltd., Montreal, Canada.
Vera Chemical Co., North Milwaukee, Wis.
Wilson-Paterson Co., Board of Trade Bldg , Montreal, Can.

Rosin Size Boilers and Dissolvers
Boving & Co., of Canada, Limited, Toronto, Ont.

Rotary Sulphur Furnaces
Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Pulp Mill Machinery Co., Montreal, Can.
Stebbins Engineering and Manufacturing Co., Watertown, N Y

Runways—Hand operated
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Save-Alls
Boving & Co., of Canada, Limited, Toronto, Ont.
Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
Waterous Engine Works Co., Ltd., Brantford, Can.

Self Landing, Self Delivery Hoists
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Screen Plates
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.

Screens
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street. Toronto.
Glens Falls Mach. Wks., Glens Falls, N Y
Harmon Machine Co., Watertown, N.Y.
Johnson, Chas., St. Henry, Que.
Marx & Co., J., London, England.
Process Engineers, Ltd., Montreal, Canada.
Sherbrooke Mach. Co., Ltd : Sherbrooke, Que
Tippet Arthur P. & Co., Montreal, Cau.
Voith, J. M., New York, N.Y.
Voith, J. M., Wurtemberg, Germany.
Waterous Engine Works Co. Ltd., Brantford, Can.
Westbye, P. P., Peterboro, Can.

Shear Legs
Morris, Herbert, Hoist & Crane Co., Toronto, Ont.

Slings
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Slitters and Re-Winders
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Cameron Machine Co., Brooklyn, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Moore & White Co., Philadelphia, Pa.
Ticonderoga Machine Works, Ticonderoga, N.Y.

Smelting Furnaces
Boving & Co., of Canada, Limited, Toronto, Ont.

Straw Cutters'
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.

Straw Dusters
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.

Straw Digesters
Boving & Co., of Canada, Limited, Toronto, Ont.

Strawboard Making Machines
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.

Steam Regulator
Pickles, W. F., Buckland, Conn.

Stuff Chests
Boving & Co., of Canada, Limited, Toronto, Ont.

Sulphite Mill Equipment
Boving & Co., of Canada, Limited, Toronto, Ont.
Stebbins Engineeringand Manufacturing Co., Watertown, N.Y

Sulphate Mill Equipment
Boving & Co., of Canada, Limited, Toronto, Ont.

Sulphur
Union Sulphur Co., 17 Battery Place, New York, N.Y.

Sulphur Burners
Boving & Co., of Canada, Limited, Toronto, Ont.
Glens Falls Machine Works, Glens Falls, N.Y.
Stebbins Engineering and Manufacturing Co. Watertown, N.

Tachometers (Hand and Stationary)
Boving & Co., of Canada, Limited, Toronto, Ont.
Schaeffer & Budenberg, Brooklyn, N.Y.

Track Systems
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Tanks
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Boving & Co., of Canada, Limited, Toronto, Ont.
Hamilton, Wm., Co., Peterboro, Can.
McDougall, John, Caledonian Iron Works, Montreal, Can

Thermometers
Schaeffer & Budenberg, Brooklyn, N.Y.

Transmission Machinery
Caldwell, H. W. & Son Co., Chicago, Ill.
Canadian Allis-Chalmers, Limited, Toronto
Boving & Co., of Canada, Limited, Toronto
Jones & Glassco, Montreal, Can.

Traveling Cranes
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Trolleys
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

MILL SUPPLIES---Continued

Turbines

Boving & Co., of Canada, Toronto, Ont.
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Smith, S. Morgan Co., York, Pa.
Voith, J. M. Co., Inc. New York, N.Y.
Voith, J. M., Wurtemberg, Germany.

Water Wheels

Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Hamilton, Wm. Co., Ltd., Peterboro, Can.
Smith, S. Morgan Co., York, Pa.
Voith, J. M., New York, N.Y.

Wire Cloth for Paper Machines

Chambers, Ltd., Toronto.
Christie, Geo., Ltd., Glasgow, Scotland.
Johnson, C. H. & Sons, Ltd., St. Henry, Montreal, Que.
Kufferath, Andreas, Mariaweiler, Germany.
Tippet, Arthur P. & Co., Montreal, Can.
Taylor, J. A., Montreal, Can.
United Wire Works, Ltd., Edinburgh, Scotland.
Westbye, P. P., Peterboro, Can.

Waste

Hough, R., London, England.

Wet Machines

Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Glens Falls Machine Works, Glens Falls, N.Y.
Hamilton, Wm. Co., Peterboro, Can.
Norwood Engineering Co. of Canada, Ltd., Cowansville, P.Q.
Process Engineers, Ltd., Montreal, Canada.
Sherbrooke Machinery Co., Sherbrooke, Can.
Voith, J. M., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford Ont.

PULP AND PAPER MILL PRODUCTS

This aims to be a complete list of the products of Canadian Pulp and Paper Mills, who are urged to send us lists of brands and watermarks, as well as the headings under which they wish to be indexed. Buyers who cannot meet their requirements from this list, are invited to communicate with the editor, who is in close touch with the mills, and will gladly furnish full information.

PULP MILLS

Ground Wood Pulp

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
Basin Electric Light & Power Co., Ltd., Montmagny, Que.
Beaver Co. Ltd., Thorold, Ont.
Belgo-Canadian Pulp & Paper Co., Shawinigan Falls, Que.
Brompton Pulp & Paper Co., Brompton and E. Angus, Que.
Booth, J. R. Ottawa, Ont.
Bronson Co., Ltd., Ottawa, Ont.
Clyde River Pulp & Paper Co., Ltd., Liverpool, N.S.
Colonial Wood Products Co., Ltd., Thorold, Ont.
Campbell Lumber Co., Weymouth, N.S.
Canada Paper Co., Ltd., Montreal, Que.
Chicoutimi Pulp Co., Chicoutimi, Que.
Compagnie de Pulpe de Dalmas, Dalmas, Que.
Davy, James, Thorold, Ont.
Eddy Co., The E. B., Ltd., Hull, Que.
East Canada Power & Pulp Co., Ltd., Nairn Falls, Que.
Foley-Rieger Pulp & Paper Co., Ltd., Thorold, Ont.
Ford, J. & Co., Port Neuf, Que.
Jacques-Cartier Pulp & Paper Co., Montreal.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
La Cie de Metabetchouan, St. Andre, Que.
La Havre Pulp Co., Ltd., Bridgewater, N.S.
Lake Megantic Pulp Co., Lake Megantic, Que.
Laurentide Co., Ltd., Grand Mere, Que.
MacLaren Co., Ltd., The James, Buckingham, Que.
McLeod Pulp Co., Ltd., Liverpool, N.S.
News Pulp & Paper Co., Ltd., St. Raymond, Que.
Nicolet Falls Pulp & Lumber Co., Nicolet Falls, Que.
North Shore Power, Railway & Navigation Co., Clarke City.
Northumberland Paper & Electric Co., Campbellford, Ont.
Nova Scotia Wood & Pulp Co., Ltd., Mill Village, N.S.
Ontario Paper Company, Thorold, Ont.
Ouiatchouan Falls Paper Co., Ouiatchouan Falls, Que.
Powell River Co., Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que.
Price-Porritt Pulp & Paper Co., Rimouski, Que.
Reed, A. E. & Co., (Nfld.), Ltd., Bishop's Falls, Nfld.
River-du-Loup Pulp Co., Ltd., Fraserville, Que.
Soucy, F. Florentine, Old Lake Road, Que.
Spanish River Pulp and Paper Mills, Ltd., Espanola, Ont., Sturgeon Falls, Ont., Toronto, Ont., and Sault Ste. Marie, Ont.
St. George Pulp and Paper Co., St. George, N.B.
Thorold Pulp Co., Ltd., Thorold, Ont.
Trent River Paper Co., Ltd., Frankford, Ont.
Union Bag & Paper Co., Cape Madeleine, Que.
Trent Valley Paper Mills, Glenmiller, Ont.
Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Q

Kraft

Brompton Pulp & Paper Co., East Angus, Que.
Dryden Timber and Power Co., Dryden, Ont.
New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
Quebec and St. Maurice Industrial Co., La Tuque, Que.
Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que

Soda Fibre

Canada Paper Co., Ltd., Montreal and Toronto.
Dominion Paper Co., Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.

Sulphite Fibre

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
Booth, J. R., Ottawa, Ont.
Dominion Pulp Co., Ltd., Chatham, N.B.
Edward Partington Pulp & Paper Co., Ltd., St. John, N.B.
Eddy Co., The E. B., Ltd., Hull, Que.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Lake Superior Paper Co., Ltd., Sault Ste. Marie, Ont.
Powell River Co., Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que.
Riordan Pulp & Paper Co., Ltd., Montreal, Que.
Spanish River Pulp and Paper Mills Ltd., Sturgeon Falls, Ont., and Sault Ste. Marie, Ont.
Swanson Bay Forests, Wood, Pulp & Lumber Mills, Ltd., Swanson, Bay, B.C.
Toronto Paper Mfg. Co., Ltd., Cornwall, Ont.

PAPER MILLS

Bag

Eddy, The E. B. Co., Ltd., Hull, P. Q.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
Ford, J. & Co., Port Neuf.
Wilson, Ltd., J. C., 61 St. Alexander Street, Montreal, Que.
Jonquiere Pulp Co., Jonquiere, Que.

Binders' Board

McArthur, Alex. & Co., Montreal.
Northumberland Paper and Electric Co., Campbellford, Ont.

Blotting

Canada Paper Co., Montreal, Que., "Velvet Blotting."

Board

See Wood Board and Cardboard Specials.

Bond

Canada Paper Co., Ltd., Montreal, Que. "Burmese Bond," "St. Lawrence Bond," "Canada Bond," "Burmese Linen Ledger," "Windsor Mills Special," "Silverstream," "Springvale," "Super Writing," "White Railway," "Railway Manilla,"
Howard Smith Paper Mills, Ltd., Montreal & Beauharnois, Que.
Kinleith Paper Co., Ltd., St. Catharines, Ont.
Rolland Paper Co., St. Jerome, Que., Mount Rolland, Que. and Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Book and Litho

Canada Paper Co., Ltd., Montreal, Que. "Art Photo Book," "Tinted Art Book," "Art Chromo," "English Book," "Satin Book," "Satin Litho," "Litho Label," "Super S. C. Book," "Standard S. C. Book," "Windsor Book."
Eddy Co., The E. B., Ltd., Hull, Que.
Kinleith Paper Co., Ltd., St. Catharines, Ont.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Box Board

See Wood Board and Cardboard Special.

Dominion Timber Regulations

Licenses to cut timber on Dominion Lands in the Provinces of Manitoba, Saskatchewan, and Alberta, the Northwest Territories, within twenty miles on either side of the main line of the Canadian Pacific Railway in the Province of British Columbia, and in the tract of three and one-half million acres to be located by the Government of the Dominion in the Peace River district in the Province of British Columbia, lying east of the Rocky Mountains and adjoining the Province of Alberta, shall be disposed of by public auction at the office of the Dominion Timber Agent for the district in which the berths are situated.

Before any parcel of timber is offered for sale it shall be surveyed by a duly qualified Dominion Land Surveyor into berths of an area not exceeding twenty-five square miles, and each of such berths shall then be thoroughly cruised by a duly qualified timber cruiser in the employ of the Dominion Government. The Minister shall then fix an upset price at which the berth shall be disposed of, and no berth shall be sold at less than the price so fixed.

Purchases to the amount of one thousand dollars or under shall be paid in cash at the time of sale. Purchases over one thousand dollars and not exceeding five thousand dollars shall be paid, one-half in cash at the time of sale, and a note or notes shall be given for the remaining half of the purchase price, payable in three months, with interest at the rate of five per cent. per annum. Purchases over five thousand dollars and not exceeding ten thousand dollars shall be paid one-third in cash at the time of sale, and notes shall be given for the remaining two-thirds of the purchase price, payable in three and six months, with interest at the rate of five per cent. per annum. Purchases exceeding ten thousand dollars shall be paid one-fourth in cash at the time of sale, and notes shall be given for the remaining three-fourths of the purchase price, payable in three, six and nine months, with interest at the rate of five per cent. per annum. Notes shall be made payable at a bank in the city or town in which the sale is held or at a bank in the city of Ottawa. Cash payments must be made at the time of sale in legal tender or by an accepted cheque on a chartered bank, or by a draft issued by a chartered bank, payable to the order of the Deputy Minister of the Interior. If default is made in any payment required by this section the sale shall be forfeited and void.

The purchaser must also pay the cost or the estimated cost of the survey of the berth before a license is issued.

The licensee shall pay an annual ground rent of five dollars per square mile except for lands situated to the west of Yale, in the Province of British Columbia, in which case the yearly ground rent shall be five cents per acre.

The licensee shall pay the following dues on timber cut on his berth:—

Sawn lumber, 50 cents per thousand feet, board measure.

Railway ties, eight feet long, 1½ cents each.

Railway ties, nine feet long, 1¾ cents each.

Shingle bolts, 25 cents per cord.

And 5 per cent. on the sale of all other products of the berth.

Timber Permits

Yearly permits are granted to settlers, mine operators and others on application to the Dominion Timber Agents, from whom further information can be obtained.

W. W. Cory.
Deputy Minister.

Department of the Interior, Ottawa,
December 20th, 1912.

PAPER MILLS---Continued

Bristol

Don Valley Paper Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.
Canada Paper Co., Montreal & Toronto, "King Bristol," "Windsor Bristol," "C. P. S.Tinted Bristol," "Canada Bristol."

Building and Sheathing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que.
British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
Eastern Paper Co., Ltd., St. Basile, Que.
Montreal Paper Co., St. Basil, Que.
Northumberland Paper and Electric Co., Ltd., Montreal.
Riordon Pulp and Paper Co., Ltd., Montreal, Que.
Western Paper Mills, Ltd., Vancouver, B.C.
Jonquiere Pulp Co. Ltd., Jonquiere, Que.
Ford, R. & Son, Port Neuf, Que.
Laurentide Co., Ltd., Grand Mere, Que.
McArthur, Alex. & Co., Montreal, Que.
McLeod Pulp Co., Ltd., Liverpool, N.S.
Walker, J. R. & Co., Montreal, Que.

Cardboard Specials

Hinde & Dauche Paper Co., Ltd., Toronto, Ont.
Jonquiere Pulp Co., Jonquiere, Que.
Macleod Pulp Co., Ltd., Liverpool, N.S.
Canada Paper Co., Windsor Mills, Que. "Victor Printers' Blanks," "Superior Translucent Bristol," " C.P.C. Coated Litho," "Superfine Litho Blanks."
Booth, J. R., Ottawa, Ont.
Eddy, E. B. Co., Ltd., Hull, Que.
Laurentide Co. Ltd., Canada Life Building, Montreal, Que.

Carpet Lining

Ford, J. & Co., Port Neuf Station, Que.
Montreal Paper Co., St. Basile, Que.
Northumberland Paper & Electric Co., Ltd., Campbellford. Ont.
Wentworth Paper Mills, West Flamboro, Ont.
Western Paper Mills, Ltd., Vancouver, B.C.

Coated

Ritchie & Ramsay, Toronto, Ont.
Georgetown Coating Mills, Ltd., Georgetown, Ont.
National Paper Co., Valleyfield, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.

Corrugated Paper

Lazier Paper Mills, Ltd., Belleville.
Hinde & Dauche Paper Co., Ltd., Toronto, Ont.

Cover

Canada Paper Co., Ltd., Montreal and Toronto, "Tinted Art Cover," "Derby Cover," "Fibrestoc Cover," "Cashmere Cover," "X Cover," "XX Cover."
Eddy Co., The E. B. Ltd., Hull, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Ritchie & Ramsay, Toronto, Ont.

Envelope

Don Valley Paper Co., Ltd., Toronto.
Kinleith Paper Co., Ltd, St. Catherines, Ont.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Felts

Bird, F. W. & Sons, Hamilton, Ont., and Pont Rouge, Que.
Eastern Paper Co., Ltd., St. Basile, Que
McArthur, A. & Co., Montreal, Que.
Ford, J. & Co., Port Neuf, Que.
Ford, R. & Son, Port Neuf Station, Que.
Montreal Paper Co., St. Basile, Que.
Northumberland Paper & Electric Co., Ltd., Campbellford.
Western Paper Mills, Ltd., Vancouver, B.C.

Fibre

Canada Paper Co., Ltd., Montreal and Toronto.
Dominion Paper Co., Montreal, Que.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
McArthur, Alex. & Co., Montreal, Que.
Riordon Pulp and Paper Co., Merritton, Ont.
Strathcona Paper Co., Strathcona, Ont.
Wilson, Ltd., J. C., Montreal, Que.

Flour Sacks

Eddy Co., The E. B., Ltd., Hull, Que.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal.

Glazed

Provincial Paper Mills Co., Ltd., Toronto, Ont.

Hanging

Lincoln Paper Mills Co., Ltd., Merritton, Ont.
McArthur, Alex. & Co., Montreal, Que.
Moira Paper Mills, Belleville, Ont.
Riordon Pulp and Paper Co., Ltd., Montreal, Que.
Strathcona Paper Co., Strathcona, Ont.

Kraft

Brompton Pulp & Paper Co. Ltd., East Angus, Que.
Dominion Paper Co. Ltd., Montreal, Que.
Dryden Timber and Power Co. Ltd., Dryden, Ont.
New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que.

Leather Friction Board

Walker, J. R. & Co., Montreal, Que.

News

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
Belgo-Canadian Pulp and Paper Co., Shawinigan Falls, Que.
Booth, J. R., Ottawa, Ont.
Canada Paper Co., Ltd., Montreal and Toronto, "Canada Brand."
Eddy Co., The E. B., Ltd., Hull, Que.
Ford, Joseph & Co., Port Neuf, Que.
Fort Frances Pulp & Paper Co., Ltd., Fort Frances, Ont.
Jonquiere Pulp Co., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Lake Superior Paper Co., Sault Ste. Marie, Ont.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
McArthur, Alex. & Co., Montreal, Que.
Miller Bros. Co., Ltd., Glenmiller, Ont.
News Pulp & Paper Co., Ltd., St. Raymond, Que.
Powell River Co. Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que.
Riordon Pulp and Paper Co., Ltd., Montreal, Que.
Spanish River Pulp & Paper Mills, Ltd., Toronto, Ont.
Ontario Paper Co., Thorold, Ont.

Roofing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que.
Ford, Joseph & Co., Port Neuf, Que.
Ford, Rowland and Son, Port Neuf, Que.
Montreal Paper Co., St. Bazile, Que.
Walker, J. R. & Co., 35 Common, Montreal, Que.
Western Paper Mills, Ltd., Vancouver, B.C.

Straw Board

Ford, J. & Co., Port Neuf, Que.
Lazier Paper Mills, Ltd., Belleville.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
McArthur, A. & Co., Montreal, Que.
Moira Paper Mills, Belleville, Ont.
Northumberland Paper & Electric Co., Campbellford, Ont
Trent River Paper Co., Ltd., Frankford, Ont.
Trent Valley Paper Mills, Glenmiller, Ont.

Tag

Don Valley Paper Co., Ltd., Toronto, Ont.
Eddy, The E. B. Co., Ltd., Hull, Que.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
J. R. Booth, Ottawa, Ont.

Tissue and Toilet

Eddy Co., The E. B., Ltd., Hull, Que.
Garden City Paper Mills, Ltd., St. Catharines, Ont.
Interlake Tissue Mills, Ltd., Merritton, Ont.
Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Que

Wall Board

Beaver Co., Ltd., Beaverdale, Que.
Bishoprick Wallboard Co., Ottawa, Ont.

Wood Board

Beaver Co. Ltd., Thorold, Ont.
Booth, J. R. Ottawa.
Brompton Pulps Paper Co. Ltd., East Angus, Que.
Canada Paper Co., Montreal, Que.
Eddy Co., The E. B., Ltd., Hull, Que.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Northumberland Paper & Electric Co., Campbellford, Ont.
McLeod Pulp Co., Liverpool, N.S.
Western Paper Mills, Ltd., Vancouver, B.C.
Wilson, J. C., Ltd., 61 St. Alexander St., Montreal Que

Wrapping

Booth, J. R., Ottawa, Ont.
Canada Paper Co., Ltd., Montreal and Toronto, "Scotch Fibre," "Invictus Fibre," Hercules Manilla," "St. Fancis Manilla," "Wave Crest Drug."
Dominion Paper Co., Montreal, Que.
Don Valley Paper Co., Ltd., Toronto, Ont.
Eddy Co., The E. B., Ltd., Hull, Que.
Ford, J. & Co., Port Neuf, Que.
Ford, Rowland, Port Neuf, Que.
Gore Valley Paper Mills, Dundas, Ont.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Canada Paper Co., Monreal and Toronto.
See also Kraft.

Writing

Howard Smith Paper Mills Ltd., Beauharnois, Que.
Kinleith Paper Co., St. Catherines, Ont.
Rolland Paper Co., Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Manufacturing Co., Cornwall, Ont.

THE PROVINCE OF ONTARIO

is rich in timber, mineral, agricultural, and other resources.

Ontario has large areas of White Pine and other valuable timbers, her timber products last year representing one-third of the total output of Canada.

Ontario has pulpwood areas practically illimitable, and offers a great field for those desirous of embarking in the pulp and paper-making industry.

Ontario has innumerable waterfalls capable of supplying power for all manufacturing purposes, which are obtainable on reasonable terms, subject to development.

Ontario has large pulp and paper mills in operation at Ottawa, Sturgeon Falls, Spanish River Sault Ste. Marie and Dryden and large plants are under construction at Abitibi on the Temiskaming and Northern Ontario Railway, and Fort Frances on the Rainy River.

Ontario is traversed East and West by three great transcontinental railways, and North and South by three others.

For full particulars as to Ontario's great resources and the advantages offered for large wood-using industries apply to

Hon. W. H. Hearst

Minister of Lands, Forests and Mines

Toronto

Paper Mill Agents and Commission Merchants

Calgary, Alta.
Davis, W. D. & Co., 3rd Street, W., and 7th Avenue.
John Martin Paper Co., Ltd.
Tees & Persse.

Edmonton, Alta.
Tees & Persse.
John Martin Paper Co., Ltd.

Saskatoon, Alta.
Tees & Persse.

Vancouver, B.C.
Brake, Creedon Co., Ltd.
Mitchell Bros., 123 Cordova E.
Smith, Davidson & Wright.

Victoria, B.C.
Mitchell Bros., 8 Bastion.

Moose Jaw, Sask.
Tees & Persse.

Regina, Sask.
Tees & Persse.

Winnipeg, Man.
Barber & Ellis
Clark Bros. & Co., Ltd., 143 Portage.
Ratcliffe Paper Co., Ltd.
Hudson Paper Co.
Kilgour Bros.
Martin, John, Paper Co., Ltd., 319 William.
McAllister & Watts.
McFarlane, Son & Hodgson, Bannatyne and Adelaide.
Tees & Persse.
John Martin Paper Co., Ltd.

St. John, N.B.
Schofield Paper Co., Ltd., 26-30 Prince William.

Moncton, N.B.
Reid, F. P. & Co.

Halifax, N.S.
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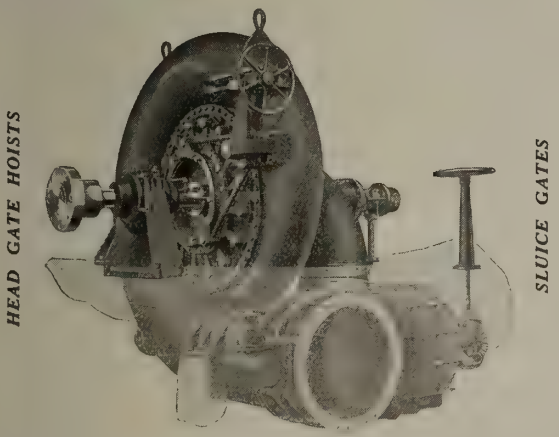

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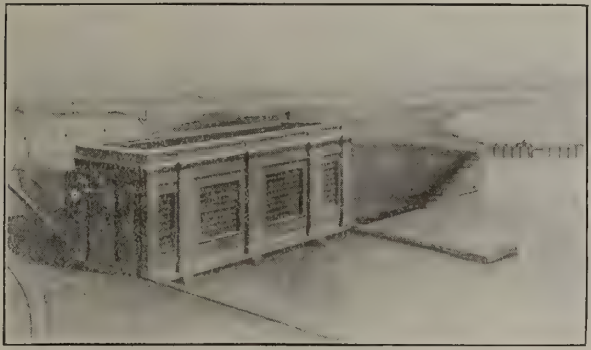

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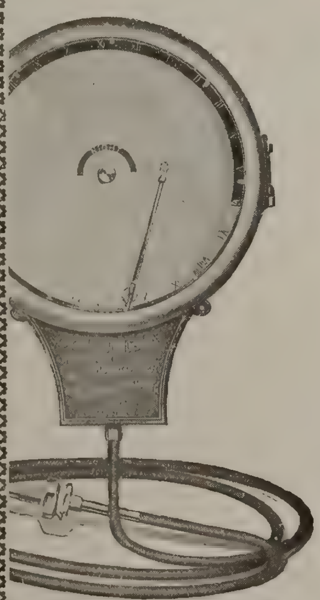

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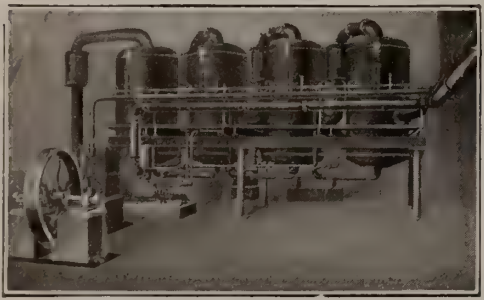

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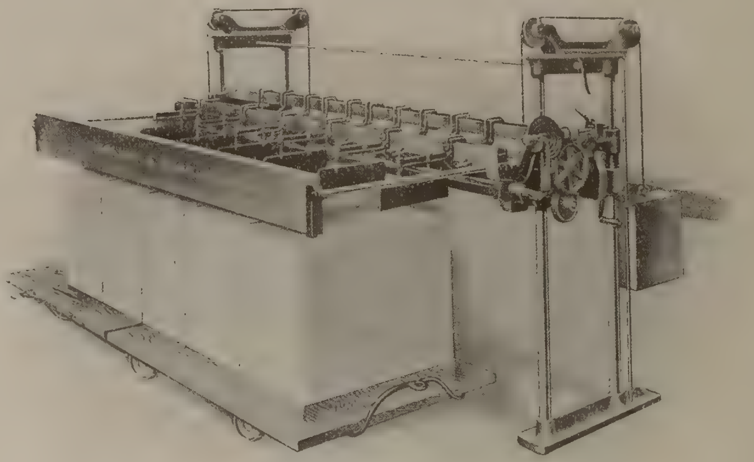

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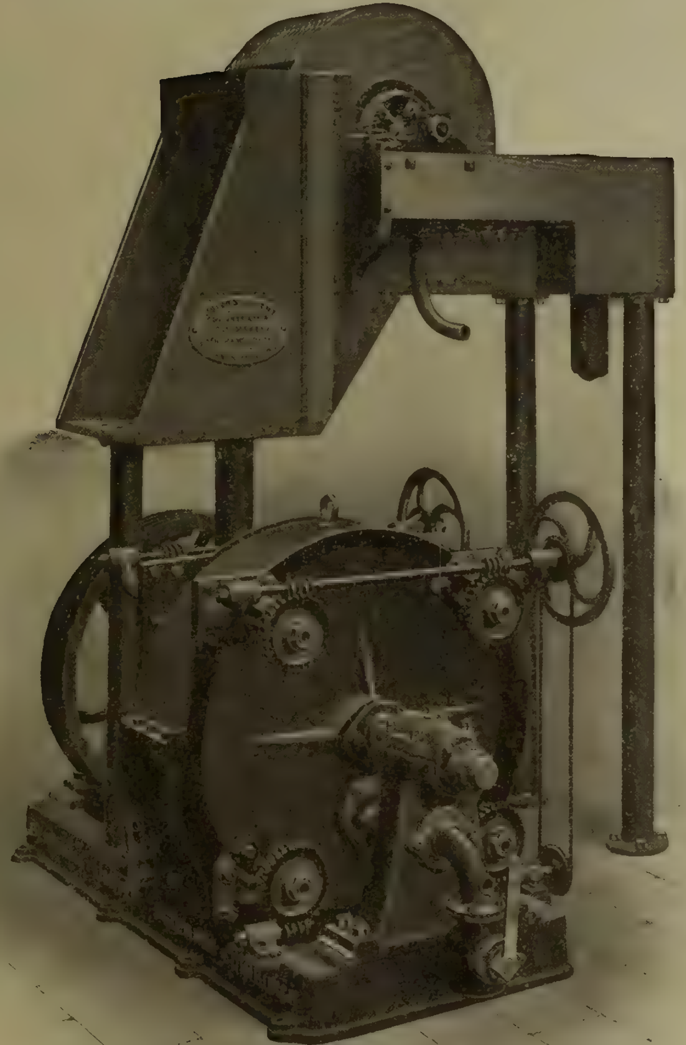

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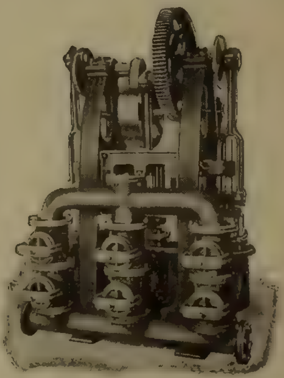

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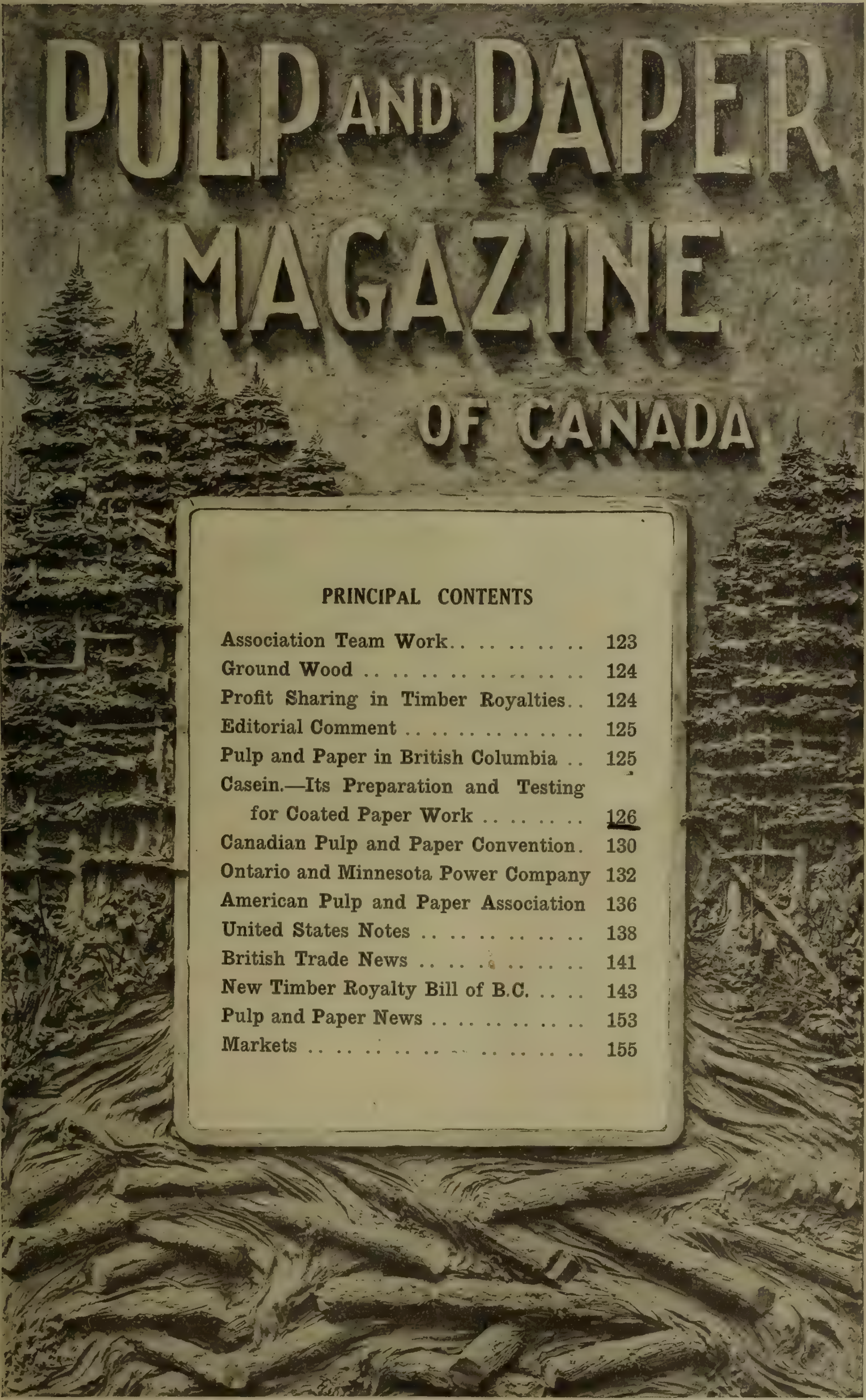

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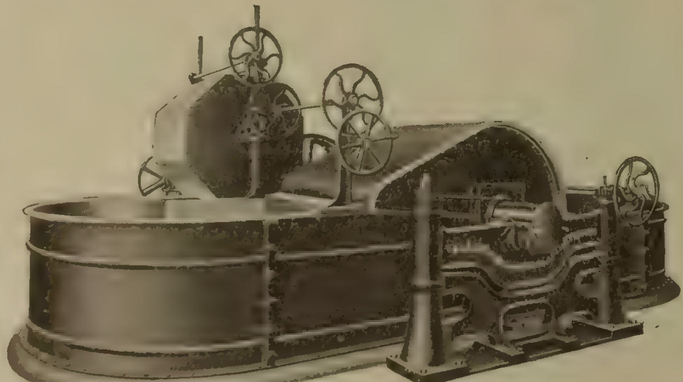

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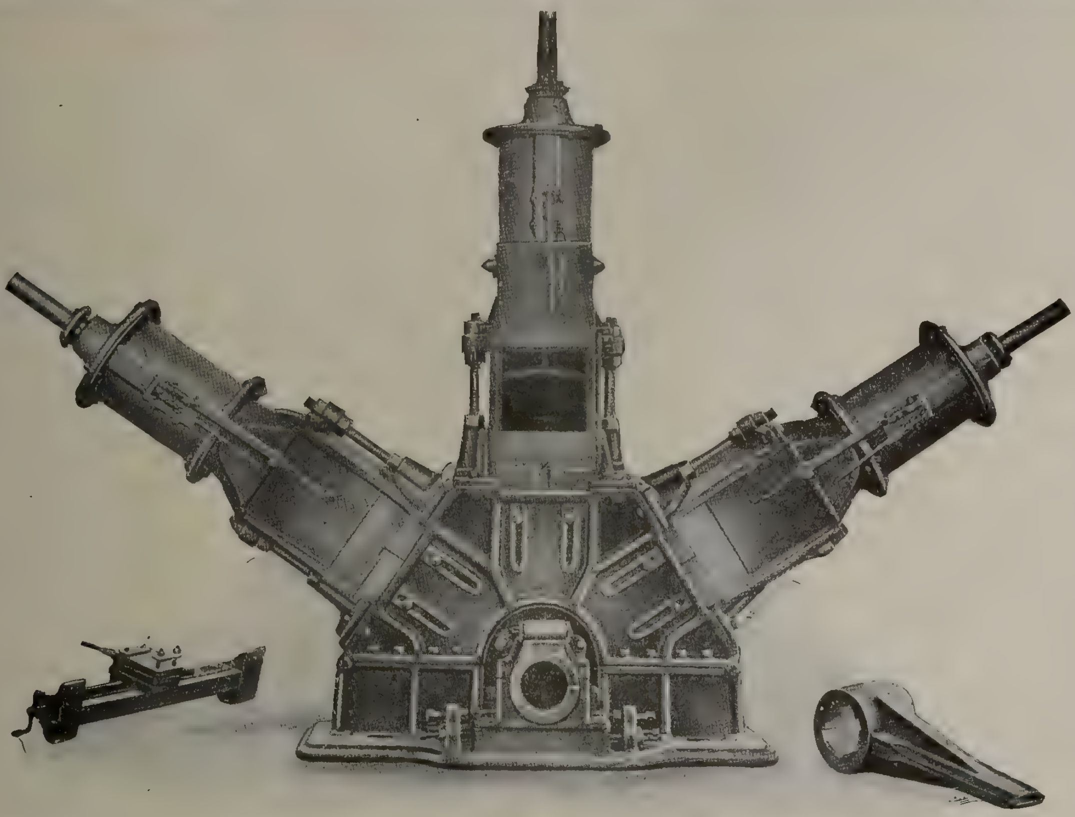

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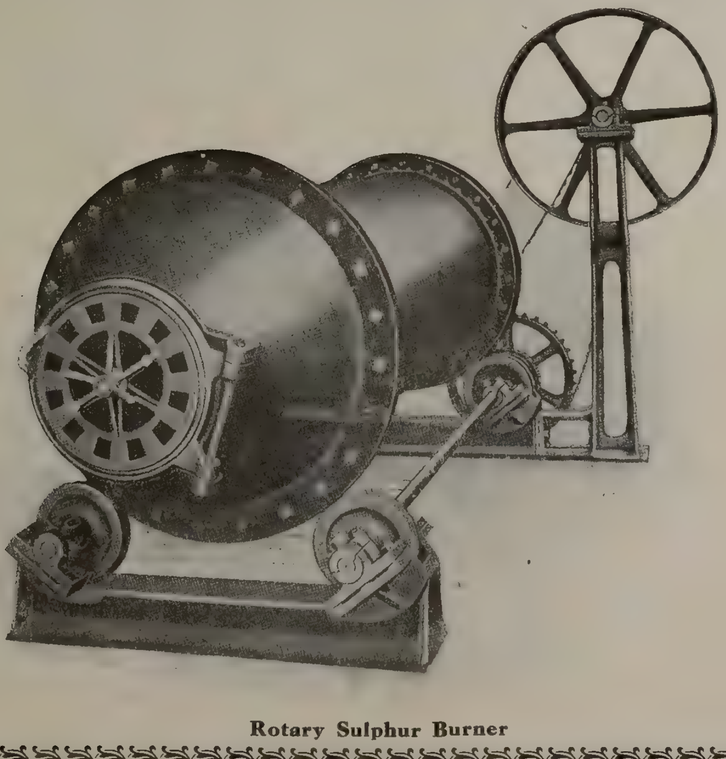

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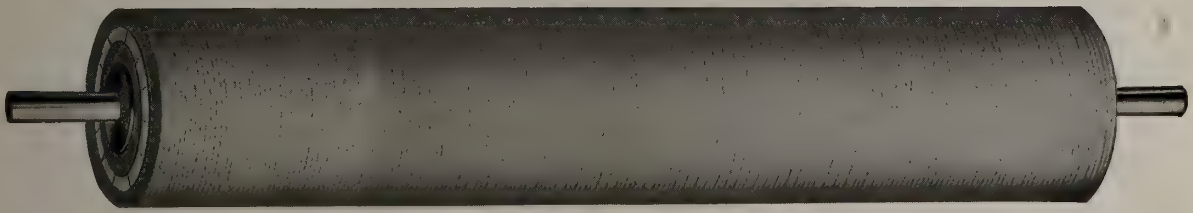

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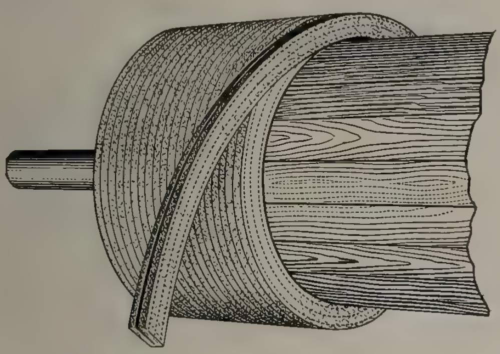

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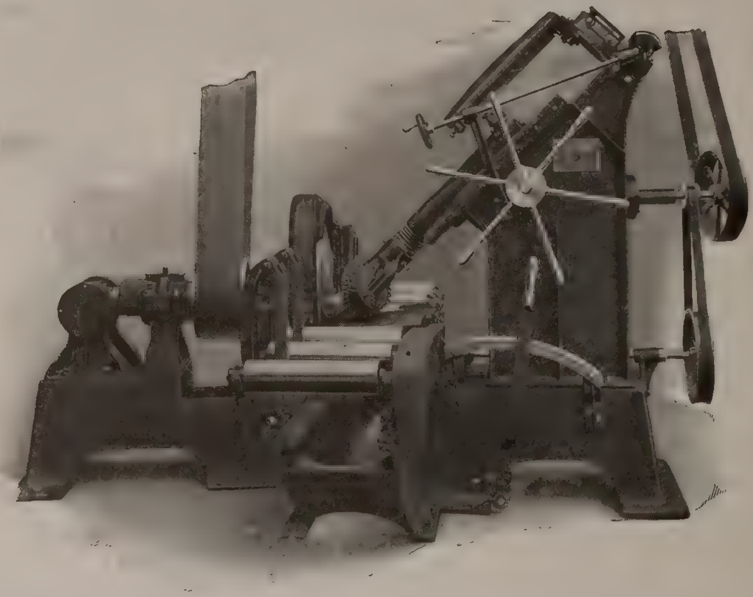

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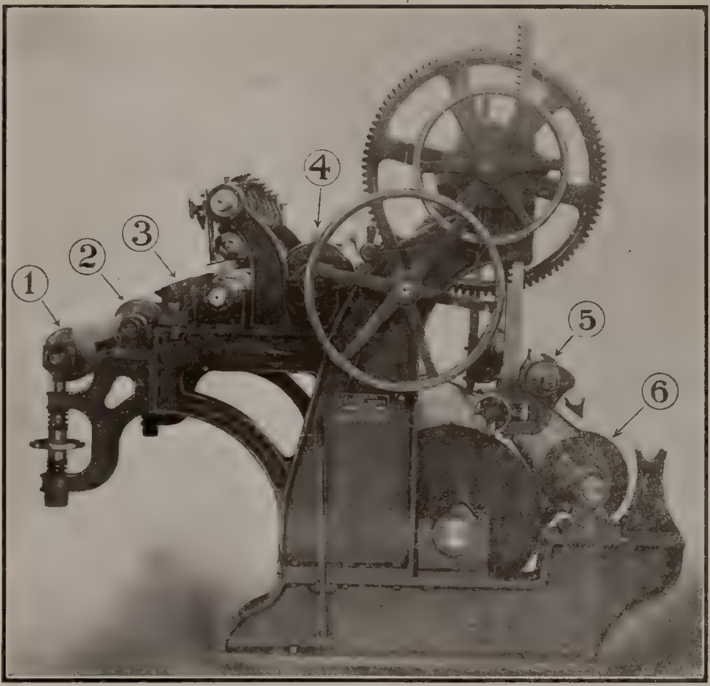

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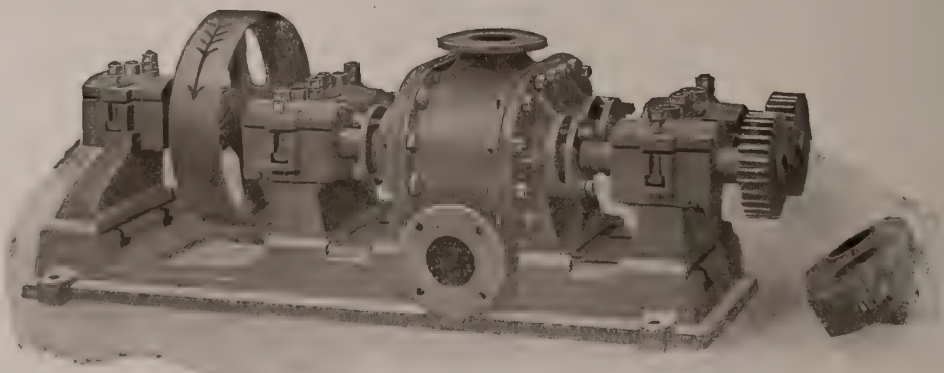

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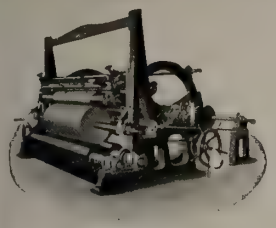

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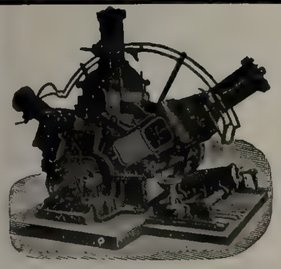

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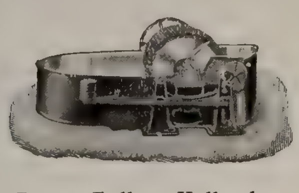

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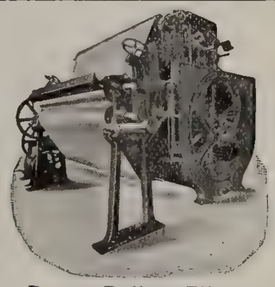

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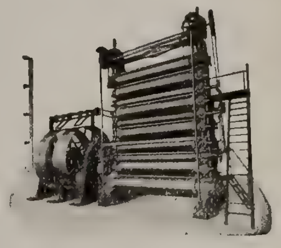

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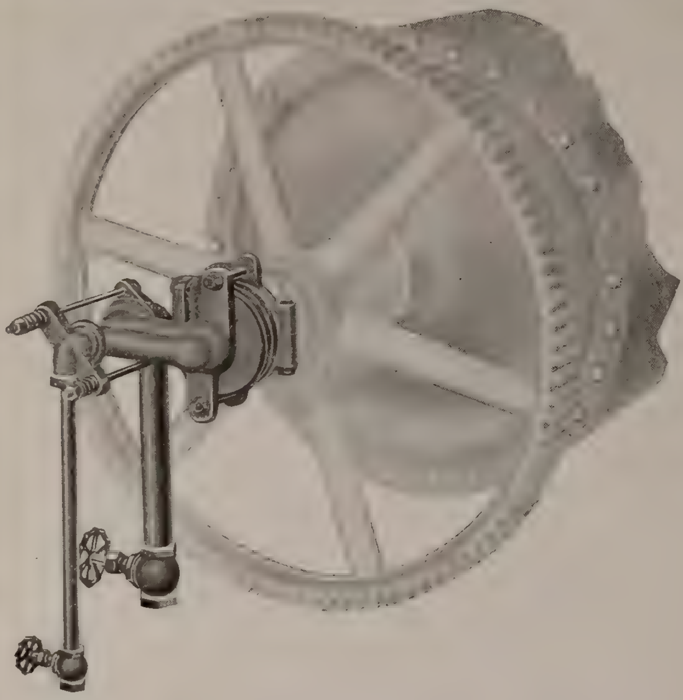

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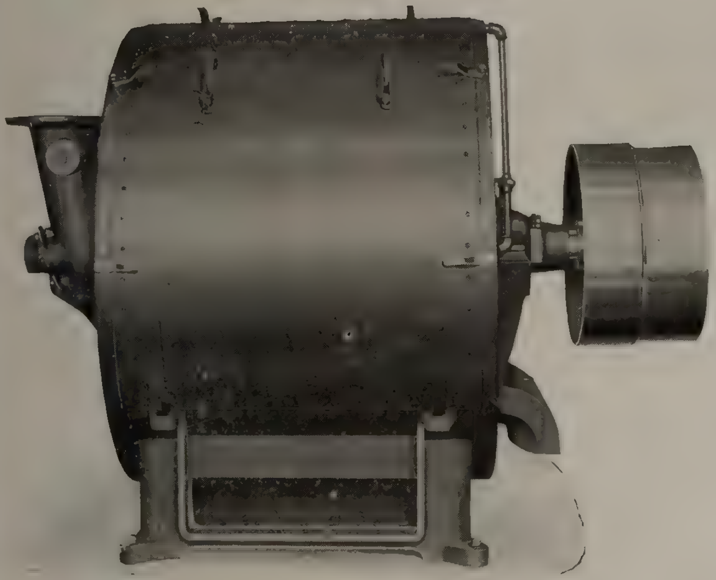

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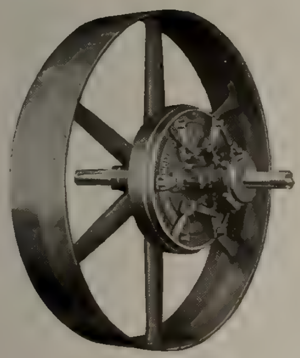

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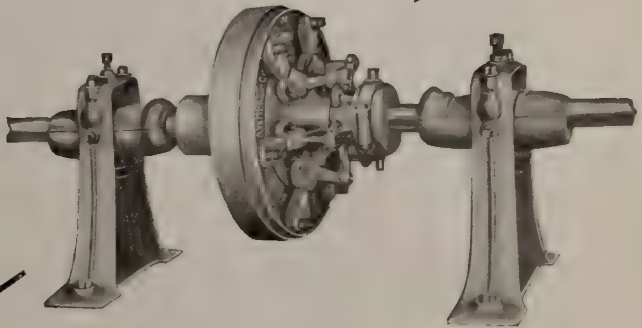

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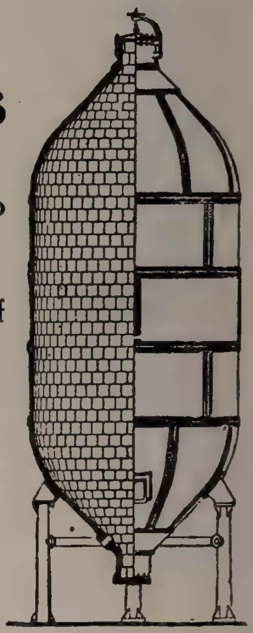

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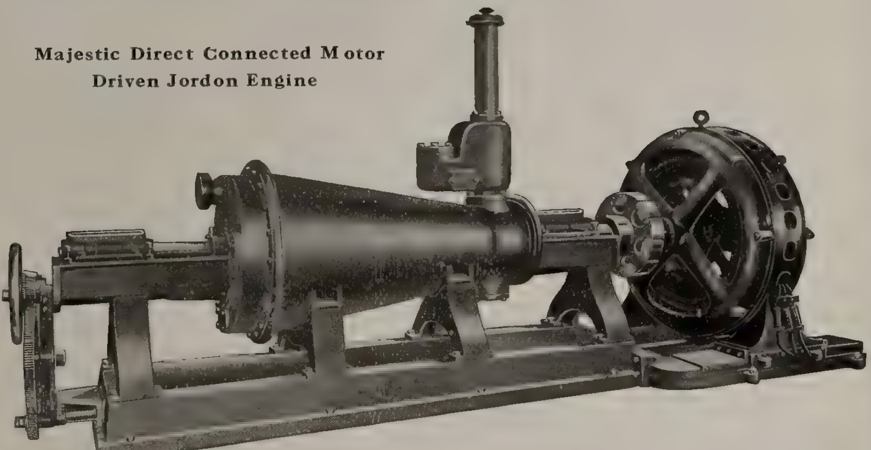

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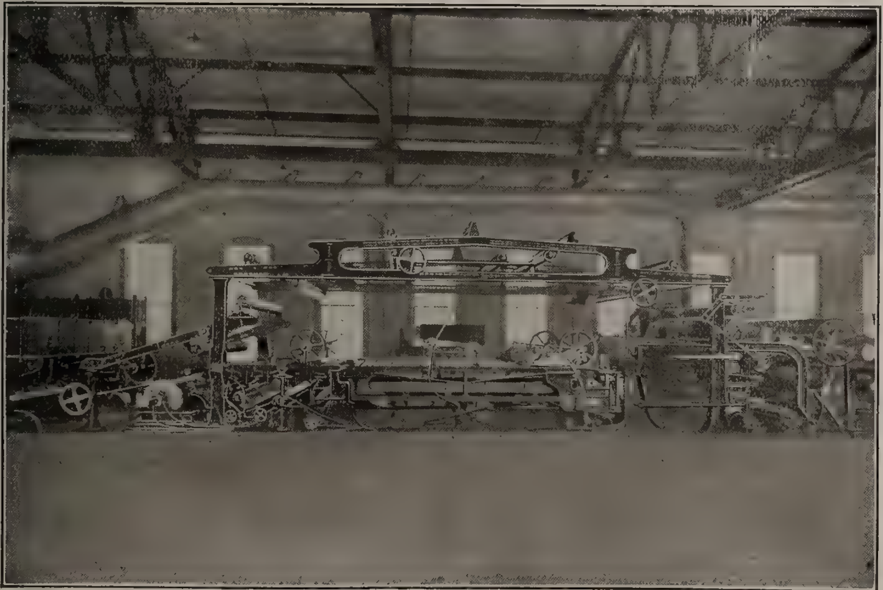

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Association Team Work.

The recent annual Conventions of the Canadian Pulp and Paper Association in Montreal, and the American Paper and Pulp Association in New York, has called our attention to the benefits of organizations in the pulp and paper trade.

Our Canadian Association has been organized about a year, and is probably on better standing than any similar organization when it was but a year old. Of course, there are many big difficulties to be overcome in launching such an organization. There is a great deal of human inertia and blind selfishness among even progressive manufacturers, which a good live association must live down. We are glad to see that our association in Canada is having remarkable progress in this direction, and that progressive manufacturers throughout the country are not only members, but are enthusiastic in their support, and fully appreciate the benefits which may be derived from good team work in the manufacture of pulp and paper.

The immediate danger of tariff adjustments at Washington, is over, but these matters will again have to receive our attention in three or four years, and there is also the question of tariff matters in our own country, which we should agree to and on which we should make united representations to the Government. It is far easier for various manufacturers to settle their difficulties in association meetings than by competitive representations to the Government. The matter of gathering statistics of our own country and in foreign markets, in which we take a large share at the present time, is one of the most important phases of the work, and affords possibly the greatest scope for development.

We have heard for example of what an efficient organization can do, in the strong aggregation of manufacturers to the south of the line. One most important point which they have found, is, the efficiency studies in their mills, which has resulted in the saving of many thousands of dollars to many individual mills.

The Association has sent capable and trustworthy efficiency men into the mills, with instructions to collect confidential information, and which could only be released by the owner of the mill himself. The results of these investigations have been the greatest surprise to the owners of these very mills, with the establishing of costs on an accurate and scientific basis. Many mills were forced to change their line of products. Some grades of paper were being produced at a loss, which was made up by their grades which showed a greater margin of profit. It was necessary to turn the mill on to the grades for which it was best suited, and which it could manufacture to the best advantage. Informaton of this kind is available to all members of the association, who can profit equally by such investigation. The saving of wastes is an enormous item in pulp and paper mill work. This question can be discussed freely in an open and broad-minded way by competitive manufacturers at an Association meeting.

The greatest difficulty which a new organization of this kind has is the feeling of fear which individual members entertain toward their fellow members, and competitors. An old organization has lived this down, but it takes years for a new organization of men, many of whom are strangers to each other, to have that safe feeling, which is necessary to the most efficient carrying out of the purposes of these associations.

The old days of gentlemen's agreement regarding prices and territory, are entirely passed—it is found impossible, until human nature changes, to maintain any such arrangements. Coming together around a common board table many competitors, who have regarded each other askance, have learned to esteem them as honest business men.

In an industry such as ours, which has so many variations, which may be studied with benefit to all members, it is quite impossible to appreciate how an industry of the proportions which the Canadian pulp and paper industry has grown to be, could remain in any loose and unorganized form. Trade abuses need correcting; fairness needs to be the motto between manufacturers themselves, as well as with their customers.

The Hardwood Lumber Association of the United States has proven what wonderful things can be done by organized efforts, by correcting such abuses. The scaling of lumber and grading, were at one time, in a state of chaos. They have now, however, assumed definite shape, and a manufacturer may rely on fair treatment. The trade feud has been overcome through many organizations in the United States, where men envious of each other have sought to do their competitor unto death. This as usual, strikes back at themselves, and also to other members of the industry.

An organization is the finest method of avoiding such difficulties. It is the greatest peace maker in industrial life.

We are glad to note and appreciate the benefits which have already come to the manufacturers of Canada through the young and growing Association of our pulp and paper manufacturers.

Ground Wood.

A recent article in the Pulp & Paper Magazine on "Power Consumed in Grinding Wood," has created considerable attention. In looking up further data on this line, it is found that there are some of the grossest examples of waste, inefficiency and poor management along these lines which one could find in any industry. There are many ground wood mills in the United States, and one or two in Canada grinding wood in localities where power is worth $30. These same mills are paying as high as $15 a cord for wood and selling, or, at least, trying to sell, their pulp at the present poor prices. It would pay these people far better to shut up many of their mills and sell their power to industries in their vicinity. There is at the present time in Canada alone many thousand tons of ground wood which is a drug on the market. Overproduction has been extreme during the last few months, and the result is that the present prices of ground wood really only provide for conversion costs and low price for wood, taking no account for power. The situation has grown very acute and, instead of going out of business or putting their properties on an efficient basis, many of these ground wood mills—some of which are small, and a few of which are large—are trying to manufacture, and spoiling the opportunities which a man situated with proper advantages is unable to reap the benefits from.

There are some new ground wood mills going up in Canada at the present time, which will aggravate the situation further, but there is no doubt that eventually it will adjust itself, although for the moment, the situation for the small producer looks rather gloomy. We think it would be well for all manufacturers of ground wood to study carefully their costs and the new discoveries, which have been worked out by the United States Government showing the most efficient methods of grinding, which have been adopted in a few mills in the United States with such wonderful results.

Profit Sharing in Timber Royalties.

A broad and new policy has been adopted by the Province of British Columbia in their new Bill recently passed regarding the increase in their Timber Royalties. The principle is advanced of profit sharing in natural resources for the people of the Province. This is a broad and new principle to be applied in this way, and is not an ideal policy as it is executed there, but is a policy based upon an ideal, and in that way must be most highly commended.

This Bill gives a fair and just measure of certainty to timber licence holders, and, therefore stability to our lumber industry. It somewhat increases present returns to the Government from timber royalty, and provides for greater and greater increases in the future: but the most fundamental thing in this Bill lies in its recognition of the profit sharing principle —in its recognition of the right of the people of British Columbia to share in the increasing value of their own timber property.

It is the product of several years of agitation and of more than a year of definite consideration of this whole royalty problem. This consideration has involved a thorough and practical investigation of the Forest Branch of the Department into lumber values and lumber costs, whose difference, less a margin of profit to the lumber operator, spells stumpage values.

The consideration of the royalty question has involved in the aggregate weeks of discussion. It has been approached by the Government with fairness and unflinchingly; and we are glad to say that it has been approached with a remarkable measure of fair dealing by most of the lumbermen themselves.

These three great purposes are as follows:—

First, so to settle this royalty question as to ensure to the highest practical degree the welfare of all the people of British Columbia as far as the forests contribute to their welfare, and that is very far.

Second, so to handle this question that the Government co-operates to the fullest legitimate extent in establishing and maintaining a permanent and profitable lumber industry in our Province; and, third, so to handle this matter, as to make forest conservation not a remote but a nearer and more profitable thing upon all timber limits.

The increase of revenue from the forest provided for by this Bill has been treated as less important than other and more vital public considerations. That the Bill will increase revenues is a happy result. It would, however, be an unhappy result were it accomplished by violation of any one of the principles—the welfare of the people, the welfare of the lumbermen, and the welfare of the forests.

The passage of this Royalty Bill settles, and settles definitely, and settles fairly, the uncertainties of recent years, both for operator and investor, which have disturbed somewhat the stability of the finances of the British Columbia lumber industry.

The principle outlined in full in our news columns regarding this Bill, must be commended by all lovers of fairness and advocates of conservation. The increase in royalties graded every five years are adjusted on a base selling price of $18.00, above that price every five years the Government takes 25 per cent of the profit. This is, indeed, a new departure in Timber Royalties, and its success will be watched with deep interest and tense anticipation by all interested in manufacture and use of forest products.

Editorial Comment.

In a lecture at McGill University dealing with watered stock and over-capitalization, Mr. David S. Kerr, C.A., remarked that there were indications that some action would be taken by the Government to restrain the watered stock artists.

It is purposed to have a law forcing corporations to set forth on their balance sheets what amounts, if any, represent goodwill, so-called.

This situation involves numerous holding companies owning and operating large subsidiary companies. Such a move is a token of a healthy development. This industry has suffered, perhaps more than any other, during the last few years by the operation of these high finance artists, and any movement to change the situation must be welcomed by all interested in the healthy development of pulp and paper enterprise and the progress of Canada in general.

* * * *

"Le Progres du Saguenay," a paper published in Chicoutimi, and controlled by Mr. J. E. A. Dubec, of the Chicoutimi Pulp Co., took a strong stand last week against Sunday work in paper mills. As pointed out recently in the columns of the Pulp and Paper Magazine, this is not necessary, and a mill can earn more money by eliminating entirely any regular Sunday work. The report of efficiency engineers of the American Paper and Pulp Association states that mill paper can be made by doing repairs on a Saturday shut-down. We heartily agree with "Le Progres du Saguenay" that Sunday work is unnecessary.

PULP AND PAPER FOR 1913 IN BRITISH COLUMBIA.

From Annual Report of Chief Forester.

The past year has been the first in which the pulp industry has fulfilled its early promise. Two mills have been in operation during the full year, the Powell River having constantly reached its daily capacity of 225 tons of newsprint. It should be noted that a small portion of this suffices to supply the Provincial market, while freight rates prevent the shipment of newsprint to points east of Alberta. A small quantity of newsprint is shipped to be distributed from Calgary and Edmonton, the balance (comprising over 75 per cent. of the output) being marketed in the North-western States.

The other operating pulp-mill of the Province, that of the B.C. Sulphite Fibre Company, on Howe Sound, has operated at capacity during the year, producing daily 40 tons of a very superior grade of fibre. The market for this product is altogether outside of British Columbia. Seventy-five per cent of the output is sold in Japan; the remainder is sold to paper-mills in the North-western States. The manufacture of pulp products on a large scale in British Columbia depends upon the solution of the problems of labour, transportation, and markets, the prospects for which are satisfactory. As for the prime essentials, this Province possesses natural resources of pulp-wood and water-power which are not equalled by any other Province in Canada, the water-power on tide-water alone being estimated to be 1,000,000 horse-power, and many billions of feet of pulp-wood being tributary to this. When the trans-Pacific market for pulp products is developed, mills on tide-water in British Columbia will thus have great advantages in seeking trade. This market will sooner or later be essential to the success of the pulp industry in British Columbia, for the section of the Canadian population which under the present basis of fixing freight rates can be supplied by the mills of British Columbia in competition with those of Central and Eastern Canada will be the limited market west of Regina, while the new mills now contemplated or under construction in Alaska and the North-western States will reduce the available market for the British Columbia product in the Western United States. Fortunately, after the completion of the Panama Canal, the trade routes of the Pacific Ocean will lead direct to the chief pulp- and paper-importing nations of the world. Asia presents a great undeveloped market for pulp and paper—a market demanding special grades produced by special machinery rocesses, and in time will require heavy shipments of low-grade papers and high-grade sulphite pulp. The Australian and South African newsprint market should also be supplied from British Columbia. The greatest pulp and paper market of the world is that extending from the Atlantic seaboard of the United States westward to Chicago.

The total value of the pulp and paper exported from British Columbia in 1913 was about $3,000,000.

This survey of the present situation shows that the expansion of the pulp industry in British Columbia depends upon the same factor as the expansion of the lumber industry—namely, the development and extension of the export market. It is recognized that this work, which is so important to the public from the standpoint of revenue, should not be left entirely to private individuals. Already in 1913 the production of $3,000,000 worth of pulp and paper has helped in the upbuilding of our commerce.

CASEIN---ITS PREPARATION AND TESTING FOR COATED PAPER WORK.

By E. SUTERMEISTER, Westbrook, Me.

In the manufacture of coated papers a mineral pigment, either white or colored, is mixed with an adhesive and spread by special machines as uniformly as possible over the surface of a web of paper. The function of the adhesive is entirely that of binding the pigment to the paper, so that it will not be removed by the type or plates during the printing process. For this purpose, casein is very largely used, having in fact almost entirely replaced glue which for many years was used for this work, practically to the exclusion of all other materials.

Casein is persent in milk to the extent of about 3.0 per cent, and may be prepared from it either by the action of rennet or by means of acid. Since the rennet casein is difficultly soluble and is not used in the coating industry, it will not be considered here. Acid caseins may be prepared either by adding acid to the milk or by allowing it to sour naturally. The former method is largely employed in this country while in South America the latter method is the most general.

The procedure in making an acid casein may be briefly described as follows. The skimmed milk, from which the fat has been removed as completely as possible by centrifugal separators, is run into large, rectangular, wooden vats, and heated to about 120 deg. F. by blowing in live steam. To this warm milk is then added dilute acid in amount sufficient to slightly more than precipitate all the casein; at this temperature the clots of casein adhere to one another so that the whey can be readily drawn off. Hot water is then added, the steam turned on and the curd washed by working it over with wooden rakes. When this wash water is drawn off the curd is found to have drawn together into a tough,dough-like mass, and this is taken out of the vat, cut up into large pieces and allowed to drain on slanting boards or racks. This drained curd is then run through a disintegrator, which shreds it quite fine, and the shredded material is spread on wire covered racks and dried in a current of warm air. In making self-soured or natural-soured casein as it is sometimes called, the curdling is caused by the natural production of lactic acid. When thoroughly curdled the whey is removed by pressing in burlap bags and the pressed curd is then shredded and drier as usual.

The method employed and the care which is exercised throughout the operations are largely responsible for the grade of casein turned out. Muriatic acid gives quite a different product from sulphuric acid, and the self-soured is not exactly like either in its working properties. If the wet curd is not promptly dried it becomes mouldy and of inferior color and strength, and the same result is caused by too low a temperature in the drying galleries, which means that the curd must be left in them for an unusually long time under the best possible conditions for spoilage. On the other hand, if the drying temperature is too high, the casein turned out will contain a large proportion of red or orange-brown particles and its solubility is much impaired. Other conditions which tend to cause a low grade product are frequently present since it is often considered a by-product by the dairies or creameries producing it, and so gets attention only when the men can be spared. As it is necessarily produced in greatest quantity when the milk supply is greatest, and the dairy the busiest, it is often neglected. Then again, the drying plant is expensive, so that one central plant is made to handle the green curd from a number of surrounding dairies and during transportation, especially in summer, this green curd has an excellent chance to deteriorate.

The caseins on the American market are received from France, Italy, Sweden, Russia, Denmark, South America, etc., as well as from numerous local sources. Since all sorts of processes are employed in these countries, and the care used is entirely problematic, it is evidently very desirable to have some method by which casein can be tested and its value determined. Although no entirely satisfactory tests, which can be applied by both the producer and the consumer, have as yet been devised, there are certain methods which are well worth considering.

In 1912 Hopfner and Burmeister published a number of analyses of technical caseins from which the following figures for moisture, fat, ash, and nitrogen have been taken:—

	Maximum.	Minimum.	Average.
	%	%	%
Moisture	10.50	7.27	9.23
Fat	2.06	0.23	0.85
Ash	4.95	3.53	4.07
Nitrogen in sample as received	13.55	12.52	12.99

For comparison with these are given the following results obtained by the writer on numerous shipments of goods received in the American markets:—

	Maximum.	Minimum.	Average.
	%	%	%
Moisture	12.3	5.4	9.64
Fat	9.9	trace	3.68
Ash	4.5	1.0	3.29
NaOH to make neutral to litmus	3.8	1.30	2.51

The wider variations in the American goods are probably due to the wider field from which they were drawn, as they are known to include a number of foreign caseins as well as a great many of domestic manufacture. The much higher percentage of fat may be due to actual difference in the caseins, but is more likely to be caused by the methods of analysis. Hopfner and Burmeister determined the fat by extraction with ether and petroleum ether which, in the hands of the writer, has been found to be very tedious and quite inaccurate, a portion of the fat always remaining with the casein. The results on American goods given above were obtained by a modification of the Babcock milk test, which was found to be more accurate and much more rapid.

In addition to these chemical tests, most of these shipments were carefully watched during use, and it was found impossible to trace any connection between the practical results and the analytical data. For this reason it was felt that small scale tests which would more nearly duplicate actual working conditions, would give more reliable information than could any chemical analysis, and the rest of this paper is devoted largely to a discussion of such tests.

Casein is a body of an essentially acid character, which is insoluble in water; the addition of alkali, however, neutralizes the acid and forms a compound which may be considered as a caseinate of the base employed. The caseinates of ammonium, sodium, potassium and lithium are soluble, while those of the heavy metals are not, but since the latter do not come into consideration in the coating industry, and since, for reasons of expense, lithium and potassium are never employed, we are concerned almost entirely with solutions prepared with ammonia or some of the compounds of sodium. Of the latter the silicate, sulphite, phosphate, hydroxide, carbonate, borate, etc., have been proposed and used from time to time, but while the phosphate, carbonate, and borate are still very generally used the other three are not commonly employed. As a standard solvent for use in testing, we have then the choice of four alkalis, but because of the difficulty of handling ammonia and of keeping it at a definite strength it is practically debarred. Of the three sodium salts the carbonate has the disadvantage of causing much foam, which necessitates extra care in making the test, while the other two are easily obtained of good purity and are of about equal solvent power. There is really very little to choose between these two, but since borax has been for a good many years the alkali most used in solubility tests, there seems to be no good reason for changing now.

The specifications for solubility under which one of the largest concerns formerly purchased its casein were about as follows: One part of casein mixed with four parts of water and 15 per cent. of borax (on the weights of the casein) when heated to 150 deg. F. and stirred three minutes, should be completely dissolved when allowed to stand one-half hour. This test is thought to be too severe in several ways, and if it is strictly adhered to will cause the rejection of many caseins which will work perfectly in practice. The time of heating and stirring is not long enough, and the temperature may go much higher than 150 deg. F. without bad effects, provided the heating is not very prolonged. There are also found occasional lots which will not dissolve with less than 18 per cent of borax, though with that amount the solution is perfectly satisfactory.

As a substitute for the above specification, the following is suggested. The sample of casein shall be ground so that all of it will pass a 20 mesh screen, and after grinding the entire sample, shall be thoroughly mixed. Of this ground casein 100 parts shall be mixed with 400 parts of water and 15 parts of commercial borax and the mixture heated and stirred till solution has taken place. In making this test the following precautions shall be observed:—At least 50 gms. of casein shall be taken for each test; the heating must be by means of a steam or water bath, and blowing live steam directly into the mixture should not be practiced; the temperature at which the solution is made shall not exceed 180 deg. F., nor the time of stirring 10 minutes. A casein to fulfill this test must give such a complete solution that no undissolved particles are observed when the solution is stirred in a glass vessel or when a clean knife-blade is dipped to the very bottom of the solution and then withdrawn.

Nearly all of the high grade caseins of the present day will pass this test, though, as noted above, there is an occasional lot which requires slightly more alkali. There is also another class of caseins which, when tested in this way, show a little insoluble residue, generally in the form of white flakes, which may or may not dissolve on further heating, or the addition of a little more alkali. The acceptance or rejection of a casein of this class depends on the particular purpose for which it is to be used, and on the judgment and experience of the one in charge of the tests, and it is not possible to lay down a general rule which may be followed in all cases.

The next quality to be considered in judging a casein is its strength. As already stated, the purpose of the casein is simply to make the clay, or other mineral matter adhere to the paper, so that its strength may be stated as the amount of casein required to make a given amount of clay adhere so firmly to the paper that it would not be removed by ordinary printing processes. By many, the strength of a casein has been considered to be proportional to the thickness of its solution or to the firmness of the so-called jelly formed when the solution is cold. Still, others judge by the length of threads formed when the solution is pressed between the thumb and finger and then pulled apart, that which gives the longest threads being considered the strongest. Many careful comparisons have failed to establish any definite relationship between such tests and the actual amount of casein used in practice, so that a more rational method was desired. The details of such a test, which has been used by the writer for many years with excellent satisfaction, are briefly as follows.

One hundred grams of clay, which has been dried at 100 deg. C., are weighed out into a thick-walled porcelain cup, 70 cc. of water are added and the cup set one side to allow the water to saturate the clay. While this is taking place 50 gms. of casein are weighed into a tared beaker, 190-200 cc. of water are added, and then the amount of alkali which has been found to give a complete solution is stirred in and the solution completed by heating on a steam bath. If 200 cc. of water, or a little less, are used, the final solution will weigh a little less than 250 gms. and it should then be brought up to this weight by adding hot water, so that each gram of casein is represented by 5 gms. of solution. The clay and water are next thoroughly worked up to a smooth paste by means of a copper rod which has been flattened into spatula form for a distance of about three inches, and which has had the flattened end turned over nearly at right angles to enable it to work out lumps which may settle on the bottom of the cup. The cup, clay and copper spatula are weighed and then enough of the casein solution (30 gms.) poured in to equal 6 gms. dry casein. This is then thoroughly mixed with the clay, and a thin coating applied to a small sheet of paper which is then marked "6" and put one side to dry. The cup and its contents are once more balanced up and 5 gms. more solution added and mixed in; the sheet spread with this is marked "7." This process is repeated till the amount of casein reaches 11 parts for the original 100 parts of clay, and unless the casein shows unmistakable signs of poor manufacture or subsequent deterioration it is seldom necessary to carry it further.

In spreading the sheets for this test a brush may be used, but it has been found more convenient to apply the coating by means of a thin steel scraper, which is made from an old saw and bent into an arc, so that it may be held in the hand and drawn across the paper with its surface nearly parallel to the latter. The edge of this scraper must be ground perfectly true and smoothly polished so that it may not leave scratches; it should also be as light as possible, otherwise it will be difficult to regulate the amount of coating applied. When using this scraper the paper should be supported by a perfectly flat surface, such as a machined brass plate, so that the coating may be applied uniformly.

When the individual test sheets are thoroughly dried they are inspected and two positions selected on each in which the coating appears of a uniform thickness on looking through it at a strong light. After marking these positions, a short stick of sealing-wax is melted on one end, applied to the paper with a moderately firm pressure and allowed to stay till fully cold. The melting of the wax may be done by means of a gas flame if care is used that it does not burn, but a better way is to make a copper box with a flat top, which can be heated by blowing steam into it, and to stand the pieces of wax on end on this box till they are sufficiently melted to adhere to the paper. When the wax is cold the paper is held down firmly by a finger on either side of the wax and the latter is removed by a steady vertical pull. If insufficient casein has been used the surface of the wax will be covered with a thin film of clay, but no fibre, when enough casein is present, the fibres of the paper will be found adhering to the wax to the very edge, while at the transition point between weak and strong, the wax will show fibres in the centre, but an edge which is bare, except for clay. A characteristic record for a casein of good grade would be about as follows:—

6 gms. per 100 of clay—clay but no fibre adheres to wax; too weak.

7 gms. per 100 of clay—fibre in centre, but clay only on edges; the transition point.

8 gms. per 100 of clay—fibres adhere over full surface; strong enough.

This casein would be said to be strong enough with between 7 and 8 parts per 100 of clay.

In interpreting this test, it must be remembered that it does not mean that in practice 7-8 lbs. of casein will hold 100 lbs. of clay, and give a coating which will print without picking, for it is found that owing to the different conditions in coating paper on a large scale, a much larger amount will be required. It, has however, been repeatedly demonstrated that the strengths as shown in the laboratory tests are directly proportional to the amounts which it is found necessary to use in actual work, so that if one casein tests 8 parts and another 10 parts per 100 of clay in the laboratory, it is perfectly safe to say that the manufacturer of coated paper will have to use more of the latter than of the former to produce the same result. It is on this basis, as a strictly comparative test, that the method jusifies itself.

In performing his strength test a number of precautions must be observed, since if they are not, the value of the test, even in a comparative way, is very slight. It has been found that the quality and fineness of the clay used exerts a remarkable influence on the test, the finer clays requiring much more casein than those of coarser texture. This necessitates keeping a supply of clay on hand, and before this is gone selecting another sample by comparison with the first so that it may be certain the new gives the same test as the old. This is not always an easy task and it is sometimes necessary to make strength tests with the same casein on a half-dozen different samples of clay before the proper supply can be secured. This same method of testing has to be applied to the paper used when the old supply runs out, only in this case both the casein and clay are the same, and the paper to which they are applied varies. The causes which makes the papers differ in the amount of casein required to hold clay on their surfaces are not entirely known, but some of the contributory causes are variations in sizing, surface finish, and the beating of the fibres. Even with a knowledge of the way in which these factors influence the results it is not always possible to tell what a given sample of paper will do, so that the only satisfactory way is to make a practical trial. Another point to which attention must be paid is the thickness of the coating applied as this has a considerable influence on the wax test. It is often found that the thicker portions of the coating will give a much lower strength than the thin parts on the same sheet, and this is the reason for the careful selection of points of uniform thickness when applying the wax. There are undoubtedly other factors which exert some influence over this test, but these three are the most important, and if the precautions noted above are carefully observed, the test will give concordant results.

It might be argued that a test which is so sensitive in several of its essential elements would be impossible of practical application, but it has been found that the same observer can readily duplicate his results and even that two different observers working in the same laboratory and with the same materials can obtain practical checks. It is, however, quite evident that unless standardized clay and paper are supplied from a central depot and personal instruction given in the method of making the test, the results of different workers will not be the same, though with a given series of caseins there should be a constant difference, i.e., one series of tests should be consistently higher or lower than the other. Lack of consideration of these facts is likely to lead to confusion and differences of opinion, and the test is, on the whole, not one which can be generally applied by both manufacturer and user of casein or which could be included in specifications for quality. It is, however, of great value to the producer of coated paper, and can well be adopted by all who desire to keep their casein consumption at a minimum.

The question of the moisture in commercial caseins has been touched upon in the preceeding portion of this paper where it was stated that goods in the American market contained on an average about 9.64 per cent, and that the maximum observed was 12.3 per cent. If much more than this is present the casein is very difficult to grind, as it appears more or less elastic and therefore resists crushing. This tends to set a practical limit to the amount of moisture which can be left on drying a casein and intentional moistening as a means of increasing the weight is probably never practiced because of the danger of its spoiling subsequently. As it is, nevertheless, occasionally desirable to determine the moisture present, it is well to note the possible methods and conditions.

The most common procedure is to dry a sample at 100-105 deg. C., and if this temperature is maintained for 2½ to 3 hours, the weights will be found to be practically constant. A long series of tests showed that different caseins do not behave in exactly the same way on drying, but in general, it may be said that sufficient decomposition of the casein to cause an appreciable error does not occur below 115-120 deg. C., and that exposure to 105 deg. C. for as long as 18-20 hours does not vitiate the results.

Another method which is capable of giving just as accurate results in a shorter time is that of distilling from a flask in which the casein is covered with water-saturated xylol or toluol. The distillate is collected in a graduated vessel, and the water which settles to the bottom may be read of directly in grams.

It is fully realized that the methods of testing described in this paper do not, on the whole, assist materially in drawing up specifications for casein, but they are probably the best which have yet been proposed for use by the manufacturer of coated papers. Since, from the standpoint of both producer and consumer, it seems very desirable to have standard tests, by which it may be accurately graded, it is hoped that this discussion may encourage others to describe similar attempts to solve this problem.

NEW WOODS FOR PAPER FOUND BY U.S. FOREST PRODUCTS LABORATORY.

(Special to Pulp & Paper Magazine.)

New York, N.Y., February 25, 1914.

A recent issue of the New York Herald is printed on paper made from woods which have not been used heretofore for news print paper.

Spruce, abundant in the New England and Lake States and in Canada, has heretofore been the standard wood for making news print paper, and as long as there was a supply sufficient to meet the needs of the paper industry, there was no reason to seek substitutes. But heavy inroads have been made on the spruce forests of the western part of the United States in this day of great circulations and large editions, especially of Sunday papers, with their many parts. On a rough estimate, a newspaper with an average circulation of sixty thousand copies and an average edition of twenty pages, uses each day the product of about four acres of forest. When this figure is multiplied by the great number of newspapers published in the United States, many of them with much larger editions, and when this is further multiplied by 365, because many papers are issued every day of the year, it can be seen that the drain upon the forests is enormous. Foresters say that even under the most approved methods known to their profession, it could scarcely be expected that spruce would be able to hold its own, but would need supplementing by other material.

It is but natural, therefore, that paper manufacturers are looking for new sources of supply which will furnish an abundance of wood pulp, at a price which will not be prohibitive. Poplar and a few other woods are used, but they do not go very far.

Forest Service Seeks New Woods.

In the national forests there are many woods considered inferior by lumbermen. Yet they are available for purchase at low rates and many of the timber stands are readily accessible. The forest service, in its desire to utilize to the best advantage all of the resources of the federal timber holdings, has been seeking proper uses for these trees, and has experimented in making pulp from them at its pulp laboratory at Wausau, Wisconsin, an auxiliary of the forest products laboratory at Madison. The Wausau laboratory is equipped with standard machinery, and all experiments are carried out under conditions which duplicate commercial practice.

As a final test of the value of some of these new woods under practical conditions, arrangements were made between the forest service and the Herald to print some part of its edition on paper made from various woods that showed promise as substitutes for spruce. These woods were ground at the Wausau laboratory; the product was then mixed with the usual proportion of chemical pulp and made into news print paper, rolls of which were sent to New York for the experimental run.

Need of a Practical Test.

The new woods must fulfill many conditions as to color, finish, and strength. In these trial runs, most of the paper is made from various western firs, which show considerable promise, but the investigators do not consider their tests complete until they have subjected the paper to actual printing conditions. They grow throughout the mountain ranges of he west, particularly in the Pacific Coast States.

In addition to their interest in finding new uses for little-used woods, federal forest officers naturally desire to keep the newsprint paper manufacturing industry within the United States. They therefore seek to present the opportunity offered by many of the woods on the national forests, where there is a supply of cheap wood available for many years to come. Other woods have been tried for pulp by the forest products laboratory and other newspapers will make experimental runs of the paper.

CONDITIONS IN LUMBER CAMPS.

(Special to Pulp & Paper Magazine.)

Ottawa, Ont., Feb. 25.—Whether or not the lumber camps of the Ottawa Valley to-day are so operated as to provide sanitary and reasonably comfortable accommodation for the lumber-jack is a subject over which a newspaper controversy has been waged in Ottawa during the past two weeks. Lumberjacks who have returned to the city lately have complained that shocking conditions are permitted to exist in the camps, and their statements have in turn been denied by the lumber operators, including all the local lumber and pulp manufacturing firms.

The complaints made by the men are to the effect that they "have to start work at three in the morning, eat a lunch of frozen bread and pork in the center of a lake at mid-day, and return to a sieve-like camp, sometimes after seven o'clock at night, to sleep on hard boards with one and one-half pairs of shoddy blankets," as one of them put it. He told tales of horses with bleeding fetlocks, of insanitary camp conditions, etc. On the other hand, officials of the E. B. Eddy, J. R. Booth and other companies stated that their men were now treated one hundred per cent better than five years ago; that they got good food and were housed in comfortable quarters. As to sanitary conditions, they pointed out that Ontario inspectors periodically visited the camps, and that they were fumigated every two weeks.

ABITIBI PULP CO. ARRANGES FINANCES.

At a special meeting of the shareholders of the Abitibi Pulp & Paper Company, the arrangements for the reorganization of the company announced by the directors was ratified. Mr. F. H. Anson, President of the company, said that the Abitibi Company had closed with a Chicago banking house for the sale of $3,500,000 securities, and that this would provide ample capital for the present needs of the company.

CANADIAN PULP AND PAPER CONVENTION.

FIRST ANNUAL MEETING.

The first Annual Meeting of the Canadian Pulp and Paper Association was held in Montreal on Feb. 26, at the Windsor Hotel.

The business meeting, in the afternoon, was attended by thirty-five members, and a paper was read by Mr. S. S. McPhail, of the Census and Statistics Department.

CARL RIORDON.
Re-elected President—a broad gauged business man.

The subject was also discussed in a paper by Mr. J. R. K. Bristol. A change such as was advocated, it was pointed out, would assist the manufacturers by a knowledge of wherein they were weak or strong, and what proportion of the imports totalling $8,900,000 might be offset by them. A close statistical investigation would show why Canada which has the labor, the material and the market, needed to import so fully.

After Mr. Howard Smith had read a paper on Trade Customs, a motion by Messrs. Wallace and Gage, to the effect that the executive be asked to draft trade customs for the trade as a whole, the draft to be submitted to individual firms who shall make their suggestions to be incorporated in general trade customs, was passed. Discussion upon the proposed new carload minimum imposed by the railroads took place, but the matter was left in abeyance for the time being, some uncertainty existing as to the real intention of the transportation companies.

Regret was voiced that the association included no more than twenty-seven of the sixty or seventy firms in the Dominion. Plans were proposed for a movement to persuade others to affiliate with the body, from which it is expected an increase of membership will result.

Carl Riordan was re-elected president. I. H. Weldon vice-president, with the following members of the executive committee: — C. Howard Smith (Montreal), F. H. Gage (Toronto), G. M. McKee (Quebec), F. H. Ritchie (Toronto), T. J. Stevenson (Montreal), K. L. Warren (Riviere du Loup), H. Crabtree (Crabtree Mills).

In the evening the Association dinner was held at the Windsor. There were but two toasts, those to "The King," and to "Canada," and the only speech delivered was that by the witty and eloquent Col. Hugh Clark, M.P., for Centre Bruce, and editor of the Kincardine Review. The chair was occupied by the President, Carl Riordan.

Col. Clark, on rising to reply to the toast "Canada," said that the fact that he was not directly connected with the pulp and paper industry was largely accountable for byhis own comparative poverty and the contrast between his own meagre personality and the prosperous and well-nourished appearance of the members of the association. While he could not share their prosperity, he was glad to share their banquet, for though a Conservative, he was a firm believer of free food. He felt amply qualified, he said, to address the members of the association, because, knowing absolutely nothing of the pulp and paper industry, he could speak freely and without prejudice. It was a proverbial axiom that individuals of the human race could always enjoy a certain degree of consolation by viewing the plight of others more wretched than themselves, and he

I. H. WELDON, Vice-President.

hoped the pulp and paper men present would get a great deal of consolation by looking at him as a wretched victim who, being a newspaper publisher, was compelled to buy their products.

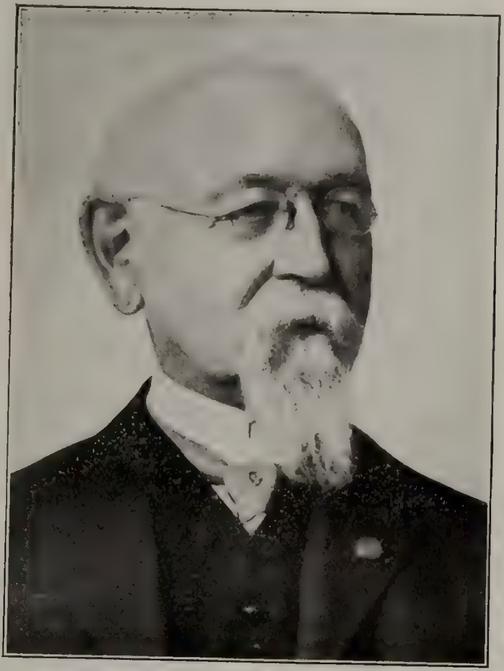
In speaking of Canada's resources, Col. Clark quoted the famous Dr. Johnson's grandiose words at the auction sale of the Thrale brewery: "Gentlemen, it is not vats and kilns you are buying, but the potentialities of wealth beyond the dreams of avarice." In a much larger sense Canada's forest, mineral, agricultural and other resources were potentialities of inexhaustible wealth of which every Canadian should be proud. Col. Clark believed that Canadians of all ranks realized this. After a lengthy political experience in the Ontario Legislature and the Dominion Parliament, he believed that the average man in public life of either political party, was trying to the best of his ability to serve the people and the country faithfully.

H. T. MELDRUM, Sec'y-Treas.

Canada in the past had been profligate of its great assets, but an era of conservation was now opening. Not the least of Canada's assets were its men, women and children, and the idea of conservation was being extended to include them. A worthy start had been made at the Guelph prison farm, where men who had gone wrong were given a fresh start without being humiliated and disgraced. The new idea in treating delinquents was that every prisoner was not a criminal and every criminal not a prisoner.

Canada's third great asset was her close connection with the Empire. Great Britain had made her mistakes, but she was still, as Lord Rosebery declared, the greatest single secular force for good in the world. So long as Britain retained that distinction, so long would she occupy the position of leading the world, and pass future crises as she had successfully passed great crises in days gone by.

The President, before dismissing his guests, referred briefly to Col. Clark's remarks about the conservation of human beings, and said that it called to his mind a subject of importance to members of the association, namely the Workman's Compensation bill now under consideration by the Ontario Government. Some employers were fighting the bill vigorously, he said, but the principle that human wear and tear was as much a charge on an industry as the deterioration of machinery was being universally recognized, and the law that Ontario was now considering would ultimately be adopted by other provinces. Mr. Riordan therefore urged a careful study of the subject by the members of the association.



GEO. H. MILLEN, Member of Executive.

GEO. M. McKEE, New Member of Executive.

On the whole the gathering was a good success for a one year old organization, and bespeaks prosperity for the industry.

ONTARIO AND MINNESOTA POWER COMPANY

(Special to Pulp & Paper Magazine.)

Toronto, February 24th, 1914.

The two million dollar news print mill, which is being erected at Fort Frances, Ont., by the Ontario and Minnesota Power Co., is rapidly nearing completion, and it is expected that all the equipment will be installed and the plant be in operation early in May next. The mill is one of the most up-to-date and advanced of any on the Continent, and will have a capacity of 120 tons per day from the two 186-inch Fourdrinier machines, which are being installed by the Bagley and Sewall Co., of Watertown, N.Y. The machines are the widest ever built by his firm, and will have a speed of about seven hundred feet per minute.

Ontario and Minnesota Power Co. New Plant at International Falls.

About four hundred men will be employed in the mill and camps and the pay roll will be half a million dollars annually. It is rumored in Fort Frances that, when the news print mill is in full operation, that even larger things will be undertaken by the Ontario and Minnesota Power Co., of which E. W. Backus is president and manager, and John J. Ross is general superintendent. The proposition of the company is to erect a large mill to make book and kraft paper and, if the plans are carried out, it will mean the expenditure of another million and a half dollars for buildings and equipment.

The brick work and cement work of the huge walls and foundations was constructed by G. A .Shannon of Chippawa Falls, Wis., and the supervision of the enterprise was under the personal direction of T. D. McAnulty, superintendent of construction for the Ontario and Minnesota Power Co., whom, it may be mentioned, is a Canadian, being a former resident of Niagara Falls. Over four hundred car loads of machinery have been shipped for installation in the immense plant.

The power for the new plant as well as that for the paper mill of the company at International Falls, Minn., just across the Rainy river, is obtained at Couchiching Falls where an immense dam and power house have been constructed and 35,000 horse-power of electrical energy is geenrated. It will be remembered that, after much litigation between the town of Fort Frances and the Minnesota and Ontario Power Co. matters were finally adjusted between the corporation and the company. An agreement was reached to the effect that the latter was to build the large mills on the Canadian side. Work was started in the fall of 1912 and continued with during the past year, and Fort Frances is now proud of its paper mills and subsidiary industries, which include the large power house and ground wood plant. The town is a natural gateway for logs, and it is estimated that over two million feet of timber pass each year down the Rainy river into Rainy Lake to Fort Frances, being sluiced through the logway specially built for that purpose.

It is expected that fifty thousand cords of spruce will be required to feed the new ground wood plant and news print mill, and the settlers have thus found a ready and easy market for their pulp wood.

The following is a detailed description of the new mill, and its equipment in the various departments:—

Boiler Room—72 feet x 72 feet. One storey high; stone, brick and steel construction. Containing four 400 H.P. boilers.

Pump Room—30 x 72 feet; two stories high; boiler feed pumps, blowers for boilers and smoke stack. Upper floor reserved for wet machines. Building of stone, brick and reinforced concrete.

Machine Room—96 x 256 feet, 6 inches; two stories high. Built of stone, brick, re inforced concrete and steel trusses. Basement 22 feet high, containing suction and stock pumps, beaters and Jordan engines, also 2 500 H.P. steam engines for driving paper machines. Upper floor 34 feet high, containing two 186 inch paper machines; capacity 60 tons each in 24 hours. Each machine has four screens located at wet end.

Finishing Room—109 x 96 feet; three stories. Built of stone, brick, and reinforced concrete, 67 feet high. Basement containing blowers for heating and ventilating mill, also machine and repair shop. First floor is used for finishing paper (wrapping). One top floor will be used for storing paper.

Screen Room—(West of machine room) 55 x 93 feet; three stories 40 feet high. Built of concrete and reinforced concrete. Basement contains stock chests and pumps. First floor contains screens for ground wood, pulp, decker machines for ground wood, and sulphite.

Wood Room—(south of Church Street)—48 x 120 feet; one storey, 18 feet high. Contains saws, barkers and conveyors to prepare the wood for grinding room.

The total length of the mill, excepting wood room is 466 feet 6 inches; width, 72 feet, at south end 151 feet, iincluding screen room; 96 feet at machine room and finishing room. Between machine room and Canadian Northern tracks are switching tracks and track with platform for loading finished paper.

PAPER PAILS AND CHEESE BOXES NEW WISCONSIN PRODUCT.

Paper pails for shipment of candy, tobacco and other things of the kind usually sent in wooden pails, and paper cheese boxes to take the place of the expensive, destructible and cumbersome wooden cheese boxes, are the latest things added to the list of Fox River Valley made goods. The paper pails are being made at the plant of the Strange Paper Company, at Menasha, and the paper cheese boxes are being manufactured at the plant of the Menasha Carton Company.

The idea of substituting paper for wood in the matter of cheese containers was conceived by the Menasha people last summer. It looked so good to them that they immediately caused to be made several thousand of them, and asked certain extensive dealers in cheese to try them in place of the wooden boxes, to determine their serviceability for the purpose. They have proven eminently successful. In fact, it is no rash prediction to say that the days of the wooden cheese box are numbered. The paper boxes are equally if not more durable; they are lighter and equal to any test the wooden box is put to. They are all that and cheaper. The reports of those who have used them have been so encouraging, in fact flattering, that the Menasha Carton Company has decided to install enough new machinery to make possible a daily output of paper cheese boxes of four thousand.

THE GREAT LABOR CONFLICT AVERTED IN NORWAY.

Notices have been given out from the Norwegian Employers' Association of a lockout comprising the iron workers, wood pulp and paper workers, and wood workers. At the same time the central organization of the laborers declared sympathetic strike comprising all work on the exposition at Christiania, all printers in the country, sailors and firemen on coasting steamers, bakers in the larger cities, and a few minor trades. Both notices were to take effect on February 19.

The mediator, Mr. Heftye, and representatives for the employers and laborers were in session all night, but an agreement was reached, by which the great conflict will in all probability be averted. This agreement will be placed before the boards of the two organizations Saturday and it is considered certain that it will be approved.

MR. HASTINGS HEAD OF U.S. EXPORT ASS'N.

(Special to Pulp & Paper Magazine.)

New York, N.Y., February 25, 1914.

The United States Paper Export Association, which have offices in the Whitehall Building, 17 Battery Place, this city, recently increased its capital from $25,000 to $100,000 in order to expand its field. New members have been taken into the organization, and a much wider field will be developed in the near future, as more lines will be added.

The Association has elected Arthur C. Hastings, who has been for several years president of the American Paper and Pulp Association, as the executive head. The other officers are: Louis Chable, of the International Paper Company, vice-president, and D. F. McIntosh, secretary and treasurer. The directorate of the organization comprises these three men, together with B. A. Franklin, president of the Strathmore Paper Company.

OCEAN FALLS CO.

Persistent efforts are being made to close out the business of the Ocean Falls Co., Limited, as intimated at various intervals of late. Now the order of the Supreme Court to dispose of the assets as a going concern, is to be carried out. An auction sale was advertised for the 23rd prox. in Vancouver. The assets consist of a most modern sawmill with a capacity of 350,000 feet per day, pulp mill, power plant of 11,000 horse-power, fully equipped logging and marine camp, townsite comprising hotel, general store, dwellings, wireless station, dwellings, wharves, warehouses, etc., 402 acres of land and valuable pulp leases and water rights.

RAINBOTH vs. O'BRIEN.

(Special to Pulp & Paper Magazine.)

Athens, Feb. 26. — Valuable timber and pulpwood limits in Pontiac County worth $2,000,000, were involved in a $500,000 judgment given to Mr. R. Rainboth of Aylmer, Que., last week in the Superior Court at Bryson, Que., against Mr. J. O'Brien of Renfrew. Mr. Rainboth sought to obtain a quarter interest in certain timber limits in Pontiac County on the line of the Transcontinental Railway, through a contract which he entered into with the defendant, Mr. O'Brien, whereby Rainboth was to get a quarter interest in the timber limits which O'Brien desired to purchase, providing he could buy them for a certain figure. The limits were twice put up for auction, but there were no bidders at upset price, and they were afterwards disposed of at a private sale. The defendant bought in the limits, which were pledged to the Merchants Bank at $750,000, and a sum amounting to $42,000 was paid out in expenses for Crown dues, etc. Seeing that the limits were pledged to the bank, which had power to dispose of them, it was held by the Court that O'Brien had parted possession with the limits, which are now valued at $2,000,000, and Mr. Rainboth was given judgment for $500,000 less his share of the $42,000 expenses incurred.

NEW MITSCHERLICH SULPHITE MILL.

As intimated about a year ago, in the Pulp & Paper Magazine, the Bathurst Lumber Company of Bathurst, N.B., were contemplating building a pulp and paper mill. These plans have now come to a final head, and they propose to build a fifty-ton sulphite mill the coming season to manufacture the highest grade long cook bleached mitscherlich sulphite fibre. The pulp and paper mills will be operated under the name of the Bathurst Pulp & Paper Co., Ltd. Mr. Angus McLean is the general manager of the Bathurst Lumber Company, and has been instrumental in bringing their plans to a final successful conclusion. The manager of the new mills will be A. G. McIntyre, Editor of the Pulp & Paper Magazine and Superintendent of the Forest Product Laboratories. The mill will be in operation on May 1st, 1915.

ANGUS McLEAN,
Gen. Mgr. Bathurst Lumber Co., who will build new pulp and paper mills.

The demand for this class of pulp in Canada is very large and, at the present time, high grade paper makers are unable to buy in the Canadian market pulp of this quality of domestic production. The Bathurst people propose to make thirty-six hour cook sulphite and bleached electrolytically. The proposed location of the mill has a decided advantage over most paper mill locations in Canada. It is on tide water, has rail connection and good labor market. They will be able to obtain a cheap supply of coal, sulphur and salt, and will consequently have a very low manufacturing cost. The mill is to be situated on the shores of Bathurst harbor on the edge of the town, and has tributary to it the Nepisiquit and Tetegauche rivers, and the limits owned by these people on the north shore of Bay Chaleur. The Bathurst Lumber Company owns 2,800 square miles of timber limits immediately tributary to the mill, and they propose to manufacture only the very highest grade of pulp. Paper mills will later be added for the manufacture of news print, a board mill for the manufacture of board, and many kinds of specialties.

NEW PRINTING BUREAU.

(Special to Pulp & Paper Magazine.)

Ottawa, Feb. 26.—Considerable interest has been taken by the Canadian paper trade in the announcement made by the Secretary of State in Parliament last week that the supplementary estimates would contain an appropriation for plans for a new printing bureau for Canada. This will replace the present bureau, which has for years been inadequate to the demands on it. Situated in Major Hill Park, it is an old structure which is now taxed to the limit of its capacity. As a result of its inadequacy, a very large proportion of Government printing has been given to outside firms, which means that the immense quantities of paper used in turning out various official publications, has been furnished by these latter. With the new bureau, which will be built large enough to turn out practically all the Government work, printing, bookbinding, etc., the Government's requirements for paper will be greatly increased and some change in the method of obtaining it may be necessary. At present it is obtained by contract instead of public tender.

A. G. McINTYRE,
Manager of new pulp and paper mills of the Bathurst Lumber Co.

BRITISH FIRM GETS PAPER MACHINE CONTRACT.

The Belgo-Canadian Pulp & Paper Co. Ltd., at Shawinigan Falls, P.Q., have placed the contract for their new large paper-making machine with the well known British engineering firm of Chas. Walmsley & Co., Ltd., through their Canadian Agents, C. H. Johnson & Sons, Ltd.

We are informed that this machine will be 202 in. in width, and is guaranteed to run at a very high speed.

American Pulp and Paper Association.

(Special to Pulp & Paper Magazine.)

New York, N.Y., February 19, 1914.

The thirty-seventh Annual meeting of the American Paper and Pulp Association was held at the Waldorf Astoria Hotel, yesterday and to-day. Wednesday was devoted to division meetings and what changes in trade customs or suggestions were decided upon, were put before the general meeting to-day.

There were six divisions which made no report to the president this year. They were: Coated Paper, Blotting, Cover Paper, Chemical Pulp, Ground Wood, and Glazed and Fancy Paper. Another report that was lacking this year was that of the Chemists, which was due from Arthur D. Little.

There was little new business taken up by most divisions. One change of rather great importance was proposed in a change in the by-laws of the wrapping division. This body has elected a tentative organization as follows: Frank L. Moore, chairman of the Wrapping Paper Division; Executive Committee: L. M. Alexander, of Wisconsin; George C. Bayliss, of Pennsylvania; M. E. Marcuse, of Virginia; S. A. Upham, of New York, and George E. Crafts, of Maine. This committee is at present in authority, but the general meeting did not ratify the change, as the matter was laid over until the first meeting of the executive council of the association, which is composed of C. A. Babcock, Frank L. Moore, Thomas Hunter, C. A. Crocker, E. C. Robertson, F. S. Harrison, E. A. Merritt, Jr., and B. C. Hill. The committee on by-laws, chosen by the wrapping division comprises: W. B. Van Allen of New York; George Sisson, of New York; and Louis Block, of Oregon. The parent body of the tentative organization is made up of Frank L. Moore, L. M. Alexander and M. E. Marcuse.

All present officers of the Association will hold over in their present capacities until the next meeting of the Executive Council, which will nominate the new heads. No election at all was held to-day. President Arthur C. Hastings will not consider a renomination under any circumstances. He has been elected President of the United States Paper Export Association, and it was reported, also considered for the presidency and general management of the Remington-Martin Company of Watertown, N.J. The name of Frank L. Moore, president of the Newton-Falls Paper Company, was mentioned and generally discussed as the next candidate for president of the association. Mr. Moore, however, was emphatic in his statements to the effect that he could not, and would not, consider such a nomination.

The remainder of to-day was devoted to a luncheon, in the Myrtle Room, and to routine matters in the general session. Addresses and discussions on topics of interest to the industry were held in the afternoon. The association decided to have a committee appointed to investigate the "Five Brother Bill," which is now before the House Committee on Interstate and Foreign Commerce. The bill is reported to be related to trusts and commercial combinations. No resolutions, however, was passed regarding the tentative legislation.

In the acceptance of the report of the committee on resolutions, the association placed itself on record as opposing the proposal now pending before Congress, regarding an increase in the postal rates of second-class matter. Another bill to which the association is opposed is that known as the Campbell Bill, and requires the printing or marking of all articles manufactured, and their certificates as to their processes.

In his annual report at the general session this morning, President Hastings said:—

The President's Address.

The president, Arthur C. Hastings, in his annual address said:

This association is now holding its thirty-seventh annual meeting. We have grown from a few mills, which, in 1878, represented an industry producing a few hundred tons of paper per day, to the present output of something like 15,000 tons daily of the various grades of paper and board, and from an annual business of $55,000,000, to, according to the United States Census, over $275,000,000, or twenty-first in importance among the industries of this country.

Prices.—Our members are fully aware that this association is not for fixing prices or restricting product, but that it is entirely educational, with the sincere hope that prices will become more uniform through knowledge of facts, and that the production will somewhere near equal the demand, due to the facts being developed by our statistics; also that our efforts have been consistently towards developing cost systems and developing conditions, through efficiency methods, that not only result in a benefit to the manufacturer, but to the consumer, as well.

ARTHUR C. HASTINGS.
President of American Paper and Pulp Association, Now Head of the U.S. Export Association.

Tariff.—The tariff, which has been settled for the immediate future, is very inconsiderate of some classes of paper and pulp, and fair on others, in view of the reductions made on some commodities.

On those papers where the duty has been altogether taken off, or reduced to a very small percentage, the expected has occurred; the importations have increased enormously, and to such an extent that the home mills have been unable to run full time, or have, run as an unprofitable proposition. Changes have been made from one quality to another in some mills; some failures have resulted through the inability of mills to sell at a profit; mills that have been burned have not been rebuilt, due to the unsatisfactory condition of business, and water powers have been harnessed electrically, and put into general commerical business, rather than using the power for making paper. These changes are constantly going on in an unprofitable business, and have resulted in injury to the protected mills. It is a question whether it would not have been better for the consumer to have left things as they were, rather than to have brought about a general disorganization. The pro and con of the tariff resolves itself into President Lincoln's remarks on this subject:

"I do not know much about the tariff, but I know this much, when we buy manufactured goods abroad we get the goods and the foreigner gets the money. When we buy the manufactured goods at home we get both the goods and the money."

And conditions have not changed since this speech was made.

A most remarkable result seems to have been brought about by the tariff, if we can believe the reports of the different publications. In Trenton, N.J., daily papers are raising their selling price one hundred per cent, charging two cents a copy, instead of one cent —and as an excuse they give the "high cost of paper." Subscription rates have been advanced by metropolitan papers, and by some 1,100 country "weeklies." One large publisher in Boston, Mass., has reduced his price from two cents to one cent, made possible, he says, by the cost of paper, due to the tariff reduction. In Minneapolis, Minn., an editorial in one of the prominent papers says that paper costs them more, in spite of the reduction in the tariff, so they gave that as an argument as to why the tariff should not be lowered or taken off. In Montreal, Canada, a prominent publisher states that he became interested in various papers with a view of standardizing widths used, so he can buy more paper, and thereby get it cheaper. Now any one of these arguments can be taken for what it is worth, and they quite compare with arguments that have been brought before the Congress and various committees, from time to time by the consumer.

Now that the publishers are complaining to the Attorney General of the United States, as to the "trust" methods of their competitors, we may console ourselves with that old "saw," which ran something like this: "When thieves fall out, honest men may get their due."

In a preliminary statement by Secretary Redfield, of the Department of Commerce, in Washington, dated February 11, 1914, the following appears:

"It will be apparent that the new tariff has not thus far resulted in any material increase of importations of manufactured articles to compete with the products of our own factories, but rather that its important effect has been to add to our food supply in such a way as either to prevent additions to prices already high or else to reduce them. This condition shows again if December of 1913 is compared with December of 1912."

Imports.—This comparison shows that for the month of December, 1913, we imported "manufactures ready for consumption," $5,000,00 more than in 1912. Of this, $5,000,000 increase, under the heading "paper and manufactures of," we have contributed 15 per cent, which hardly seems fair.

Depreciation.—It has always seemed to me that we are not treating our business in as serious a way as we should. I take it a man stays in the business for no other reason than for a profit, or because he cannot get out of it. A profit is merely the difference between the cost and selling price, and where many manufacturers deceive themselves is in the cost. There is one large item over and above the cost of material, labor, etc., that must be reckoned with, but very seldom is; that is, depreciation—not only on the machinery and buildings, but what is going on all the time, unforeseen —the depreciation of a mill, due to the building of new mills, which have modern machinery, producing, probably, at a less figure than the old, which must reduce the value of the old mill. I venture to say that very few mills have done justice to themselves in depreciating their plants from year to year. The result of proper bookkeeping would show a loss, and as no man likes to face that showing, the result should be a tendency to raise the price to show a little credit balance.

Profit.—In some countries the Government insists upon a fair profit being made by corporations, and objects, on the other hand, to excess gain. Our Government, on the other hand, sems to take a different view of the manufacturers' rights.

Trade Customs.—Trade customs should be freely discussed, and after adopted, firmly adhered to. No one practice demoralizes trade and prices more than unintelligent marketing. Lowering prices to get an order is not nearly as disastrous as lowering the standard of trade dealings. A recovery from the first fault can be immediate, but the latter is very slow.

Labor Conditions.—Labor conditions in the paper business, so far as we are advised, are in a normal condition. I believe our employees realize the unprofitable condition of the paper business, as a whole, and have not been unreasonable in their demands. There is no question but that the conditions as to hours of labor will be more uniform all over the United States than they are at present.

Water Power.—Water power conditions in the last twelve months have been rather unusually good. In fact in some quarters there has been too much water, and, under the law of average, we may expect different conditions during 1914.

Export.—Exporting, as applying to the paper business, is a very important branch of the business that should be looked into and nursed by the American manufacturers. From our investigations we find that the trade of the world in paper is constantly increasing; that there are comparatively few countries that export paper; that there are a great many countries that do not manufacture paper, and, are, therefore, buyers. We have not held our position in this respect with other paper making nations, and it must be largely due to our not taking the matter up vigorously and intelligently. The advantage of paper sold to other countries is two-fold, and any legitimate means of increasing exports in any grade of paper from this country should have the fullest co-operaton of all manufacturers.

Statstics.—The value of statistics is recognized in every large industry, and one has only to note the daily papers from day to day to see reports of business conditions in the various industries as reflected by comparative conditions in their respective line; and so a careful manufacturer of paper and pulp can watch market conditions by our reports, and gauge his conditions as to manufacturing and marketing by his only perfect guide—"supply and demand."

Reports and Membership.—We had in 1908 some 224 mills reporting, and to-day we have 352. Our membership has grown in the same time from 100 to 267. There has been a falling off in the membership due to one of the large sections deeming it advisable to segregate their industry from the general paper business, due to some conditions which are peculiar, they claim.

We are sorry to have them withdraw their support from the association. Many of them, however, retain a nominal membership still, believing that the work the association is doing is of benefit to them as well as to the other grades of paper manufactured.

Visitors.—During 1913 we had 2,022 visitors at our headquarters.

Labor Bureau.—Our Labor Bureau during the year had 1,200 applications for positions, and we secured positions for 250. This bureau could be made more useful if the mills would give us more perfect information regarding men leaving their employ and the hiring of new men.

Tonnage.—Our membership represents in tonnage 85 per cent of the capacity of the mills, and we should have 100 per cent, both in reports and membership. I believe we have before us an era of much better demand than we have had for some time, and to get the best results from these conditions we should know supply and demand. It should be the duty of every manufacturer to see that his neighbor and friend joins the association, and co-operates with that end in view.

Report of the News Print Division.

On behalf of the News Print Division, Vice-President Charles A. Babcock presented the following report:

"For the last few years the manufacturer of news paper has had to have a large supply of optimism to call upon to make up for the unsatisfactory condition he has found his business in. Being harrassed on all sides, it is requiring a great deal of courage to even keep on manufacturing this grade of paper. Possibly the hardships encountered may eventually be good for the business.

"From making the business appear very attractive to outside capital, mills have been financed and built in other countries, which, so far, I believe have proven unproductive. This has been so serious that it has stopped the investment of foreign capital in this business, and it would seem as though supply and demand are within touching distance.

"The unprofitable condition of the business has led domestic manufacturers during the past year to change machines from news to other grades, so that the total production of news paper in the United States during 1913 was, according to the figures submitted by the American Paper and Pulp Association, between seventy-eight and seventy-nine thousand tons less than during the preceding year, and as the greater portion of this shifting of machines to other grades was made during the last half of the year, I confidently believe the production this year will be less even than during 1913. It is fair to suppose that this reorganization will continue as long as prices remain at cost, or less, with the majority of the mills.

"In the year 1913 the production of the American mills, as reported by the American Paper and Pulp Association, was 91 per cent of the normal capacity of the mills, while the imports have increased enormously, as shown by the following figures:

1909 there was imported	24,911	tons
1910 " " "	57,651	"
1911 " " "	59,522	"
1912 " " "	88,367	"
1913 " " "	223,222	"

"This shows an increase in the five years of 800 per cent, and no manufacturing industry can hope to be remunerative under these conditions, but, as 'every cloud has a silver lining,' so the news paper manufacturers may see a little 'light' ahead, due to the fact that this serious competition has led them to reckon with their costs, and they have decided they must not sell below them. It only needs a little confidence to restore the business on a footing where it will show an interest on the investment at least.

"Trade customs, or a basis upon which paper of certain grades shall be sold, are most important. A basis of weight should be adhered to; guarantees as to production should not be allowed, because the privilege is too often abused; freight rates should not be guaranteed, in view of the possible advance in freight rates. As scarcely any article bought by the mills is delivered to them, why should they deliver their goods to their customers without considering the extra cost they are liable for? In fact, to put the business upon a proper footing, should not every mill sell its paper f.o.b. the cars at shipping point, making the consumer pay the freight? A business that is being run as closely as is the manufacture of news paper, should endeavor to eliminate, if possible, excessive costs. Goods sold delivered means the tying up of a great deal of capital in freight and storage, and should be eliminated, not only at a profit to the mill, but without hardship to the consumer."

The Banquet.

Six hundred and eight diners, including members of the association, delegates of other organizations, guests of honor and friends, attended the banquet, held Thursday evening in the main banqueting hall of the Waldorf Astoria, which concluded the annual meeting. The dinner was served promptly at 7.30 o'clock and the post-prandial speechmaking at 10 o'clock and continued until 11.30 p.m.

John Strange acted as toastmaster and introduced with appropriate remarks and jests the speakers of the occasion, who included the Rev. Nehemiah Boynton, D.D., of Brooklyn; the Hon. W. B. Northrup, member of the Canadian Parliament at Ottawa; Professor Francis Harvey Greene, of the Westchester Normal School, of Chester, Pa.

A HARBOR FOR ST. LAWRENCE PULP & PAPER.

The Dominion Government has undertaken to develop a harbor for the safe anchorage of vessels up to 6,000 tons burden for the St. Lawrence Pulp and Lumber Corporation, of Pabos Mills, Que. This country, which is financed by Amercan capital, is making good progress with the construction of its plant. A group of buildings measuring 900 feet by 200 feet is being erected, including a pulp mill for making high grade bleached sulphite pulp. The contracts for making high grade bleached sulphite pulp. The contracts for these buildings are in the hands of the Aberthaw Construction Company, of Boston. The plant is to be ready by September.

TO CUT PULPWOOD FOR EXPORT.

It is anonunced that Messrs. Blair and Rolland, of Montreal, have just closed a deal for the sale of their freehold timber limits in Gaspe to an English syndicate. The limits have an area of about 50 square miles and are situated near New Richmond. The purchasing syndicate has acquired the property for the purpose of cutting pulp-wood for export to the United States, and operations will be started at once.

UNITED STATES NOTES

(Special to Pulp & Paper Magazine.)

One of the few representatives of shippers to appear before the Inter-State Commerce Commission in Washington on February 15 with no protest against the proposed 5 per cent freight advance which the Eastern Roads desire to make was: James L. O'Brien, representing the paper companies in Sault Ste. Marie and Sturgeon Falls, Ont., and Chillicothe O. The shippers, Mr. O'Brien said, did not object to the increase, and were willing to abide by the judgment of the Commission. C. H. Tiffany, of Boston, traffic manager of the Pulp and Paper Association of New England, declared that the protest of his clients was not against the proposed increase as such, but against the relative adjustment of rates, which gave shippers of paper and pulp in other sections of the country an advantage over those in his territory.

* * * *

In a letter to the Collector of the Port of New York, dated February 17, Assistant Secretary of the Treasury Hamlin ruled as follows on the proper classification of wrapping paper:—"(1) The provision in paragraph 326 for 'wrapping paper not specially provided for' is a more specific designation than that for 'all other paper with coated surface or surface not specially provided for.' Wrapping paper with coated surfaces are, surfaces rate, therefore, dutiable at the centum ad valorem under paragraph 326, centum ad valorem under paragraph 326. (2) As the provision in paragraph 324 for 'cloth-lined or reinforced papers' is without qualification, reinforced or cloth-lined wrapping papers are dutiable at the rate of 35 per centum ad valorem rather than under paragraph 326. (3) Paragraph 324 provides for 'grease-proof and imitation parchment papers' which have been super-calendered and rendered transparent or partially so, by whatever name known' and 'all other grease-proof and imitation parchment papers, not specially provided for in this section, by whatever name known'. In view of the specific provision cited for the classification of papers of this kind, by whatever name known, oiled wrapping papers and imitation parchment wrapping papers are also dutiable at the rate of 35 per centum ad valorem under paragraph 324. (4) The waterproof wrapping papers represented by the samples submitted, not being of the character described in paragraph 325 are properly dutiable under paragraph 326 at the rate of 25 per centum ad valorem."

* * * *

The log cut in the State of Maine will be about 171,300,000 feet this winter, conditions having been favorable nearly all the time since cutting began last fall. Hauling to the landings is now progressing rapidly, and it is expected that every stick cut will reach the driving waters. Estimates of the extent of operations are now being made, and the East branch cut is placed at 45,000,000 feet. The Katahdin Pulp & Paper Co. has taken out 6,000,000 feet of pulp logs, and there are some other operations. On the West branch of the Penobscot, the saw logs amounted to 22,000,000 feet, while the Great Northern Paper Company will have 57,300,000 feet. The Great Northern's Kennebec River cut is about 15,000,000. On the other waters the operations include about 26,000,000 feet.

* * * *

A fire that caused a property loss of about $10,000 occurred on the night of February 16 at the Lincoln mill of the Fox River Paper Company at Appleton, Wis. The damage done to the stock at the mill, caused cheifly by water is estimated at about the same as the property loss.

* * * *

The Colonial Paper Company of Mechanic Falls, Me., is now is now busily engaged in supplying the U.S. Government with Lanston monotoype key-board and casting machine paper. This company was the successful bidder on this paper last month, when the Public Printer called for supplies for furnishing the Government with paper for 1914. The contracts calls for 63,000 pounds at 6.5c per lb. The price paid last year for the same amount was 6.25c per pound.

* * * *

Liabilities amounting to more than $4,300,000 are listed in a petition in bankruptcy filed several weeks ago in Utica, N.Y., by John Hunter, the well known Fulton manufacturer. It is said, however, that the figures make the failure appear greater than it really is. The principal Hunter industries, the Hunter Arms Company, The Battle Island Paper Company, and the Hunter Fan and Motor Co., have been operating for several months by a creditor's committee.

* * * *

Joseph W. McDowell, an employee of the Pusey & Jones Company of Wilmington, Del., sailed several weeks ago for Lyoa, Siberia, where he will superintend the ~~building~~ of a paper machine there. Mr. McDowell is employed by the company as an erecting engineer, and some time ago erected a machine in Mexico for the same company. He is expected to be in Siberia about seven months. The plant where the machine is being erected is the Nicola-Pavda Company, and the machine is of the Ford-Denier type.

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In discussing business conditions in the paper industry with a representative of the press, Alexander R. Curre, of the George Irish Paper Co., Buffalo, N.Y., says:—"Business looks a great deal better this month than it did in January. It is very reassuring. We will have a pretty fair Spring opening, and I believe it wiwll get better right along. I base my belief largely upon outside information when it comes to the general outlook. I am in a position here to talk to travelling men from all over the country. I was talking to a Michigan mill man the other day, and he told me that conditions were very good in that State and a letter from Wisconsin was similarly reassuring. Business is going to be better, too. I feel very sure of that. With the first sign of Spring, I think general conditions are due for an instant stimulus."

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Cornell & Ward have ordered four large machines for their factories at Kaukauna and in the East. These machines will be used in the manufacture of sanitary paper towels. They are being made by the Kaukauna Machine Works.

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All officers and directors of the Wolf River Paper & Fibre Company at Shawano, Wis., have been re-elected for the ensuing year. Last year the company doubled its capacity in the paper mill and this year expects to double the capacity in the sulphite mill. They can now make sixteen tons of sulphite a day, but this will be increased to 32. This will mean considerable new machinery, a larger building and a good deal of work during the coming season.

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Beer mats made of pulp are not to be regarded as "printed matter," according to a decision of the Board of United States General Appraisers. The mats in question were imported at St. Louis by Wilfred Schade & Co., and were returned for duty by the Surveyor at the rate of 35 per cent ad valorem under Paragraph 447, Tariff Act of 1909. The importers said that duty should be levied at 25 per cent under the provision of the law regarding printed matter, on the ground that on the mats was printed matter in the form of an advertisement.

* * * *

The United States Treasury Departmen is getting ready to loosen up to paper manufacturers throughout the country under claims for drawbacks on importations of wood pulp under the "favored nations" clause of the tariff regulations. It is said that over half a million dollars will be distributed in New England as soon as claims now pending are all proved. Word to this effect has been received by Congressman Treadway from Assistant Secretary Hamlin of the Treasury Department, and it is good news to those paper manufacturers who have put in claims for drawbacks.

PULP AND PAPER REFUND.

The Board of United States general appraisers has decided that pulp wood and newsprint paper produced from wood cut on Crown Lands in the Province of Quebec was not assessed by the Dominion Government with countervailing duty when exported to this country, and that, accordingly, free entry should have been granted when imported here under the Canadian Reciprocity Act of July 2, 1911.

The action of the collectors of customs at Detroit, Buffalo, Burlington, Plattsburg and Port Huron, in exacting duty was reversed. The importers included the Laurentide Paper Company, Limited, William A. Bird, the Central Vermont Railway Company and others. A somewhat similiar claim was made by the News Pulp and Paper Company, but over-ruled for lack of evidence.

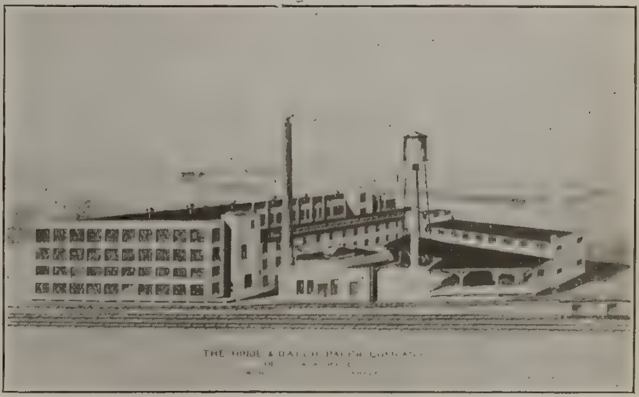
Fred Farnum, ground wood superintendent for Price Bros., has left and returned to Rumford Falls, Me.

W. R. Davis, who has been in the paper line for some years in Calgary under the name of the W. R. Davis Co. The large building in that city, formerly occupied by the Cockshutt Plow Co., has been leased for a term of years and a representative stock will be carried.

Hinde and Dauch Paper Co.

The Hinde and Dauch Paper Co. of Canada now have their new board mill in Toronto in full operation, and things are working smoothly, the output being forty tons per day of jute, chip, filled and other kinds of board. The plant is modern in every detail and about half of the new product is being placed on the market for distribution, while the other half is used by the company in their corrugated paper box factory, the capacity of which has been doubled by the recent extensions. Container board specialties will also be turned out at an early date. The new board mill and equipment cost over a quarter of a million dollars, and the entire plant and buildings of the company on Hanna Avenue, Toronto, represents an investment of about three hundred and fifty thousand dollars.

The Hinde & Dauch Paper Co. of Canada, Ltd., who are manufacturers of corrugated paper specialties, commenced business in Toronto, in January, 1910. They located at Dovercourt Road and Sudbury Street, in a building with a floor space of 50 x 50 feet, owned by the Dominion Glass Co., Limited. A few months later, they purchased from Geo. H. Hees, Son & Co., Limited, their property and two buildings located on Hanna Ave., and moved into same the latter part of August of the same year.



New Mill, Toronto—Hinde and Dauch Paper Co.

The business increased very rapidly, and soon outgrew these premises. It was found necessary to secure additional manufacturing space for the box factory, and they therefore decided to erect a new building which could be utilized for the manufacturing of board and also corrugated boxes.

They started the erection of the new structure November 1912, and completed the same on December 1st, 1913. This building, of brick, steel and concrete, is 264 feet long and 60 feet wide, four storeys high. The two upper floors are utilized for the manufacturing of corrugated boxes, and are equipped with all up-to-date machinery to fully complete the work. The extension also maintains a complete printing outfit, consisting of two large rotary printing machines.

The board mill has a capacity of 40 tons per day, and is equipped with six 1,200 lb beaters, and screens, manufactured by The Waterous Engine Works, Brantford, Ont., four 20-ton Jordan Engines, manufactured by Messrs. Noble & Wood Co., Hoosick Falls, N.Y., and cutters which were made by the Seybold Machine Co. of Dayton, Ohio.

The machine is a 124 in. machine, built by The Downingtown Mfg. Co., East Downingtown, Pa. It has four cylinders, three sets of press rolls, two stacks of calenders, and a Millspaugh suction roll. There are forty-four, 48-inch dryers on the machine. The steam engines were furnished by The Goldie-McCulloch Co., Galt, Ont., and the motors and generators by The Canadian Crocker-Wheeler Co., St. Catharines, Ont., and

Beater Room—Hinde and Dauch Paper Co.

The boiler plant is complete in every respect, and equipped with three 150 h.p. Canada Foundry Company's boilers.

The beaters are driven by a three hundred horse-power electric motor, and each of the four Jordans by a sixty horse-power motor, while scattered throughout the extensive plant are thirty-two motors from five to twenty-five horse-power for running the box board equipment and the rotary presses in the printing department. All the floors are concrete and the structure is fireproof throughout. The beaters are located on the second floor, the Jordans and board machine being on the first floor. The general offices are also on the second floor, and were laid out, as well as all the other departments, including the mechanical installation complete, by Orville H. Moore, general manager of the company, who has been in charge ever since the branch was established in Canada four years ago. Mr. Moore is the patentee of the Moore and Adirondack screens which are widely known to the trade, and also holds a number of patents on paper making and box board making machines. He has had a thorough and wide experience in all grades of paper, pulp and sulphite products, and during his twenty-five years' connection with the industry has been with the Glenn Falls Paper Co., of Glenn Falls, N.Y., the Dexter Sulphite Pulp and Paper Co. of Dexter, N.Y., and the Hinde and Dauch Co. in their various plants on the other side of the line. Mr. Moore is yet a young man, being on the sunny side of forty, but he has made a splendid reputation for himself as an inventor and manager.

Machine Room—Hinde and Dauch Paper Co.

George Brown, late of the Booth board mill, Ottawa, who has also had a wide experience in the trade, is the superintendent. The new industry is a credit to the company, and is one of the few large enterprises in the paper line carried out in Canada during the past year.

The company are able to turn out all grades of box boards, and pasted boards, and also all styles of corrugated shipping cases. The large plant places them in a position to take care of all orders promptly.

SOME USES FOR WASTE SAWDUST.

Sweeping compounds are largely composed of sawdust and silicious material, together with some such binding medium as rosin, tar or some of the crude oils in the market. The idea is to impregnate the sawdust with some cheap mineral oils that oxidize but little and keep moist for a long time. Aqueous oils are also considerably used, as they mix readily with water. If too little fluid or oil is used, the sawdust will not be given its highest absorbent efficiency, and if too much is used, oil or flat stains are likely to show on the swept surface.

The following formula will give an idea of the ingredients and processes necessary for making a sweeping compound: Melt 2 ounces of paraffin wax in 2 quarts of paraffin oil over a water bath; add 6 ounces coarse salt, 5 pounds of white sand, 10 pounds of pine sawdust and 1 ounce oil of eucalyptus—the latter is merely to give a pleasant odour. Mix thoroughly and knead until every particle shows moisture. Heap and leave over night, so the oil may soak into the fibre and spread evenly. This formula would probably prove much more profitable if a cheaper oil were substituted for the paraffin, and it is merely given to show proportions. Such a compound is packed in boxes and retailed by grocers at 10 cents for the 1 pound size and 25 cents for 3 pound packages.

The grocery stores also handle the fire-kindlers, which are largely composed of sawdust. In certain localities, where gas is not used, there is a considerable market for these. Ordinarily they are made by melting 6 pounds of resin in 2 quarts of tar. Cool slowly, and, when quite cool, mix with as much coarse sawdust as can be worked in with a little powdered charcoal added. Spread on boards or specially constructed frames until set, then cut into blocks one inch square. These blocks are retailed by the dozen and burn with a blaze strong enough to light any kind of a fire.

Sawdust is being used to a considerable and growing extent in many machine shops as a substitute for cotton waste. It has been used with cement to make a concrete floor into which nails may be driven. A floor of this kind in the public library of Springfield, Mass., is said to be a success. Reports from Hamburg, Germany, state that sawdust mixed with magnesium chloride is used there extensively for floors in the larger commercial buildings, where it is said to be popular because of its cheapness and partly fireproof qualities.—(Wood-Worker.)

BRITISH TRADE NEWS

SPECIAL TO PULP & PAPER MAGAZINE

London, February 16, 1914.

The largest contract for paper ever obtained in the British trade is believed to be that given out by the Encyclopædia Brittannica Co., Ltd., publishers of the Encyclopædia Brittannica, to Messrs. L. S. Dixon & Co., paper agents, Liverpool. Originally the order was obtained by Mr. Sheldon Leicester (Messrs. Dixon's former traveller), and the sum payable under the contract was about $139,200. After the contract had been exploited to a certain extent, and many hundreds of tons of Indian paper had been delivered, upon which Mr. Leicester received his commission, differences arose between Messrs. Dixon and the Encyclopædia Brittannica Co., Ltd., the latter declining to accept any more paper, as it was not up to the contract standard—at least, it was alleged it was not. The question, therefore, arose whether the traveller, who having got the order, was entitled to commission upon the paper invoiced to the Encyclopædia Britannica Co., Ltd. Twelve months ago Judge Darling decided that under an agreement of 1907 between Messrs. Dixon and Mr. Leicester, the latter gentleman was not entitled to his commission, which was in or about $1,440. From that decision Mr. Leicester has appealed and the High Court of Appeal has upheld the decision of Judge Darling. The case all through has been fought with remarkable ability, and it transpired that legal proceedings threatened between Messrs. Dixon and the Encyclopædia Britannica Co., Ltd., in which there was a claim for $139,200 and a counter-claim for $662,400, have been withdrawn from the courts. Prior to the proceedings being withdrawn a lot of evidence was taken in America on commission.

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The cotton blanket now familiar amongst the working-class people has somewhat of a rival in a paper blanket. The "Journal of the Royal Society of Arts" points out that "the process of taking from the body of the fabric to add to the surfaces can manifestly be carried on until no thread structure is left, and in some directions the raising of the surface in order to produce a fleecy fullness has defeated itself. Thus, in the North of England there is a quite inconsiderable sale of the highly raised blankets, which commands all purses in the south. The housewife wants "cloth" blankets for her money, being persuaded that these more solid and only lightly-raised blankets wear better than the spongier sort." The conclusion, adds the journal, is the outcome apaprently of attempts to raise too much pile upon blankets of no great initial substance. The new product of the paper machine, the paper blanket is made with unsized wood-pulp, crinkled like tissue paper sometimes used for decorative objects and printed with colored stripes in imitation of the "headings" of the regular article.

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Through the kindness of the Society of Dyers and Colorists, Mr. Clayton Beadle—the joint production of himself and Dr. Henry P. Stevens — read papers on "The Effects of Mineral Loading upon The Physical Qualities of Hedychium Paper" and "Tests to Determine the Relative Strength of Some Natural Fibres." Hedychium, as is well known, is indigenous to Brazil and four tons of pulp per acre per annum can be obtained from it. Dealing with the question of loading, Mr. Beadle said that beyond a certain percentage of loading, the mineral had a tendency to displace the fibres as opposed to filling up the interstices between them. When it reached such a point a weakening tendency set in. The Hedychium mineral-loaded papers showed high elasticity up to about 30 per cent of loading, and the experiments showed that the influence of different proportions of mineral matter in combination was very complex and deserved further study. Concluding a highly technical paper on "The Elasticity of some Natural Fibres," Mr. Beadle pointed out that if paper could be made to assume the strength of the fibre bundles from which it was prepared, then the paper yarn industry would be enormously benefitted, especially if a correspondingly high wet strength could be obtained, but that was too much to be hoped for, although a great deal might be done in that direction. Such an accomplishment would lift the paper yarn products above the sphere of jute, although the application of the solution would in any case be limited on account of its nature and color, quite apart from its physical qualities.

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The Kellner-Partington Paper Pulp Co., announce that the £250,000 four-and-a-half per cent first mortgage Debentures become due on April 1st next, and now offer to the holders of the existing four-and-a-half per cent Debentures the opportunity of exchanging, free of expense, in whole or in part, the Debentures they now hold for the four per cent Mortgage Debenture stock on the following terms: The company will allot to each Debenture holder accepting this offer in respect of each £100 Debentures so exchanged £100 of the new Debenture stock, and will pay to him the sum of £5 on each Debenture in addition to the interest accruing on each Debenture up to April 1st next. The stock now offered will rank equally in every respect with the existing four per cent Mortgage Debenture stock. The total amount of this stock is limited to £660,000 and the stock will constitute a first floating charge on the entire assets of the company. The exchange will take place as from the 1st April next, and due notice will be given of the dates when the present Deebntures should be sent in for exchange. Any four and-a-half per cent Debentures not so exchanged will be paid off at par on April 1st with accrued interest to that date. The conversion scheme now announced was contemplated in 1908.

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The adverse trade conditions during the latter part of 1913 were felt by the East Lancashire Paper Co., of Radcliffe, a mill which has not made quite as much profit last year as it did in the two immediately preceding years, but it is still able to pay 15 per cent on both the ordinary and the preference shares, and make the balance forward £6,000 more than it was a year ago. Taking a period of a quarter of a century, the company has been a remarkably good dividend-earning concern. It got into back-waters about the middle of that period, but new methods of management brought about a good recovery, and while the dividend has been maintained at its present rate for several years, the elements of stability have been increased, a reserve of £30,000 and a balance forward of nearly £38,000 having been accumulated. A good part of these sums is represented by trade credits, but there is £11,483 in cash, and, of course, the loan capital (£19,320, including interest) is smaller than it would be if the company were not using some of its own money, in addition to the share capital of £105,835. Taking full years, the showing of the balance sheets for the last three years is as under.

	1913.	1912.	1911.
Profit..	£18,766	£19,040	£19,548
Brought forward	31,972	25,724	18,968
Available	50,738	44,764	35,516
Dividends 15 per cent. ..	11,250	11,250	11,250
Bonus share div. 5 per cent	1,542	1,542	1,542
Carried forward	37,946	31,972	25,724

The Company puts £4,000 each half year to the depreciation fund, the aggregate of which is now £108,808.

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Mr. Edwin Hamer (President) occupied the chair at the half-yearly meeting of the North of Ireland Paper Mill Company, Ltd., which was held in the Grosvenor Hotel, Deansgate, Manchester, recently, and in submitting the report, said the directors had an unpleasant alteration in their position, for, instead of a profit which it had usually been their good fortune to announce, they had to report a loss of £1,000. The directors had been compelled to make changes in their management, and during the last two years they had considerable trouble with respect to their water supply for Ballyclare Mill. Encroachments were made on their supply, the water polluted and injury no doubt had been done to their trade. An arrangement was now made which might possibly help them out of the difficulty. His tongue was tied on many matters, yet because some things would possibly have to be arbitrated upon they would certainly be able to show, at least to the satisfactoin of themselves, that they had sustained serious damage. The directors asked the meeting not to take a pessimistic view of things. The position at the mill was improving, and he thought they would soon work the concern round again to its former success. The Directors recommended payment of a dividend of 10 per cent, and they had £47,876 to carry forward. The report was passed, and the retiring officials re-elected.

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The Dalsholm Paper Mills, Glasgow, formerly occupied by John Craig & Sons, Ltd., have been taken over by Smith, Stone and Knight, Ltd., of Birmingham and Bristol. There will be no change in the conducting of the mill, except that Mr. James Stuart, who had been in charge of the mill for a brief period, has accepted an appointment as English representative for Caldwell & Co., Paisley, makers of starches and papermakers' suppliers.

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At the annual gathering of the employees of the Abbey Paper Mills, owned by Grosvenor, Chater & Co., Ltd., Greenfield, Mr. Alfred Chater, speaking on behalf of the firm, said they were thoroughly satisfied with the work that had been done at the mill. They considered the workpeople had kept up the standard of paper, if not actually improved upon it. It was, therefore, well that they should know what was going on in the trade. Last year he had referred to competition being greater than ever in consequence of the large increase in the number of paper machines laid down in England and Scotland, the lower prices which most firms in London were making at. The competition then was nothing to what it was now. It was keener every day, and unless they kept up the quality of their paper, they could not hope to make a living for employed and employer. They could sell a thousand tons of good paper, but they could not sell 1,500 tons of bad paper.

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Another mill fire is reported from Scotland. A section of the pulp store and a few minor buildings in the mill of the Clyde Paper Co., near Cambuslang, Glasgow, were destroyed by an outbreak, and damage estimated at £4,000 has been done. It is fortunate for the company that the main buildings of the mill have been saved and work is proceeding apace uninterrupted.

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Manchester port ranks first in the United Kingdom among ports for the importation of wood pulp, which is now the principal commodity used for paper manufacture. Large quantities of the Canadian pulp arrives at Manchester, and everything points to the fact that the port is becoming an important one for Esparto grass imports. Of the 204,932 tons of Esparto, or 6,000 tons more than in 1912, which England imported, Manchester received 4,331 tons. By the way, Norwegians report that the recent shortage of Esparto has created an extra demand for sulphite and sulphate pulps.

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Another mill which seems to have had a little bad luck in 1913 is Olive and Partington's, at Glossop. For 1912 it reported a gross profit of £67,873, or £62,290 after paying £500 in directors' fees, £2,400 in tax on incomes, and £2,683 in legal expenses. In 1913 the gross amount fell to £55,448, but there were no legal expenses to come out of this, and the net profit, after paying fees and income tax, was £52,548. The depreciation allowance is now reduced from £19,000 to £15,000, and the dividend on the ordinary shares from 17½ to 15 per cent, but if it may be assumed that the depreciation allowance is in no way excessive, this is £2,452 more than has been earned, for the balance forward is reduced from £6,864 to £4,412. Last year also the balance forward was cut into to the extent of £1,710. There is no reserve fund, but in the course of 13 years £197,500 has been applied to depreciation, and probably this is considered as good as those nominal reserve funds, which are wholly invested in the business. The goodwill still stands in the balance-sheet at the reduced item of £12,084. It should be added that only the 5 per cent preference shares are in the hands of the public.

* * * *

Messrs. Henderson, Craig & Co., Ltd., wood pulp importers and agents for some Canadian mills, have declared a dividend of 25 per cent on their ordinary shares, and carried forward a balance of £3,043.

DR. FERNOW, PRESIDENT.

Dr. B. E. Fernow, Dean, Faculty of Forestry, University of Toronto, and Bristow Adams, of the U.S. Forest Service, have just been elected president and secretary, respectively, of the Society of American Foresters, the largest organization and, with the exception of the Canadian Society of Forest Engineers, the only association of professional foresters in the western hemisphere.

New Timber Royalty Bill of B.C.

(Special to Pulp & Paper Magazine.)

The Royalty Bill comprises these four things:—It fixes the royalty increase for 1915, and establishes a level of lumber prices on which future increases will be based. It provides seven five year periods for royalty adjustment; and it provides that for each of these periods, a given percentage of the price increment for lumber shall be added to the royalty. This percentage is 25 per cent for the first five years, and rises gradually to 40 per cent for the last five year period. The fourth of the accomplishments of the Royalty Bill is to re-adjust the rentals between the Coast and the Interior, and fix them for the whole period of the Act.

First, the Royalty increases for which the bill provides takes effect on January 1st, 1915.

British Columbia Forests.

The Bill provides that these increases shall be, for the Coast lumber, from the present royalty of 50 cents to 75 cents, an increase of 50 per cent. This increase, however, is not applied arbitrarily, but is the result of raising the royalty on different classes of logs in a proportion which puts the highest increase on the best logs, and no increase at all on logs of such low value that the increase would mean that they would be left lying in the woods.

That plan is the particular application of the broad principle of Forestry:—To encourage the utilization of low grade material which otherwise might be wasted, and charge a fair rate of increase upon high grade material, which in any case would be utilized, because in utilizing it lies the chief margin of profit in logging.

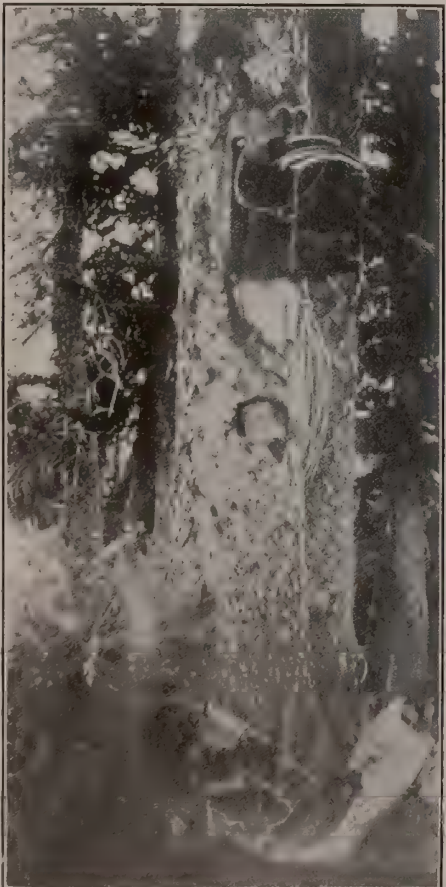
The Royalty increase in 1915 provides that in the Interior, Royalty shall be increased by the use of the B.C. scale instead of the Doyle. That means an increase of probably 40 to 50 per cent in royalty to the Government, and is an equitable adjustment of Royalty between the Coast and the Interior. In the Central and Northern Interior, regions of great prospective timber development, the Government has imposed in the Royalty Bill a Royalty charge of 65c per thousand feet board measure. This again fairly represents the relative conditions as to lumber value in that region, as compared with the Interior and the Coast.

These three increases take place in 1915, and hold good for five years, or until 1920. Then comes the first readjustment based on increase in the actual lumber price of $18.00 fixed by the Bill.

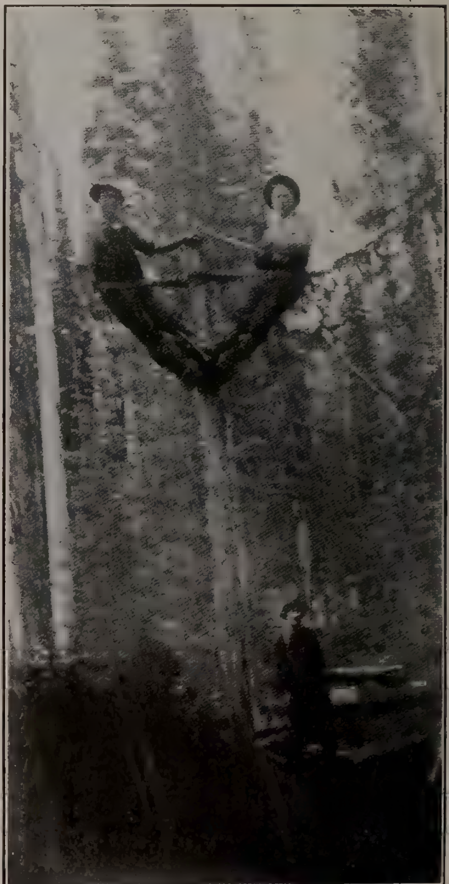
"Are they too high?" might ask some man of open mind who had not been fully informed. The central facts of this adjustment must be kept well in mind. They merely take up a certain amount of slack, and they impose upon the industry so small an increase for its raw product that they cannot fairly be claimed to disturb existing financial conditions. They pre-suppose—as any reasonable man must pre-suppose—that this period of depression through which we have recently passed, and from which we are already emerging, is a temporary thing. They pre-suppose that in British Columbia, as in the rest of the world, the price of lumber will not continue to fall spasmodically; and that the general tendency will be up, and not down.

"Are they too low?" another open-minded man might ask. They might have been higher, for the Government had the whip hand, and they might have been two or three times as great, and still have been well within the limits of power. But this plan and policy of royalty re-adjustment is not merely a money raiser for the present, a financial emergency measure to wring the uttermost farthing out of the lumberman. Moreover, the financial condition of our lumber industry at present is not a very rosy one. In the aggregate, some of the mills are making a little money, and some

Logging in British Columbia.



A Telephone in British Columbia Woods.



Building Telephone in British Columbia.

are losing a little money, but the general average is to break a little better than even, that is at the present moment. A little better than an even break; that is in general the lumberman's situation to-day. If that were made by ill-considered royalty increase merely an even break, or a little below an even break, the result would be to deal a body blow to an industry not altogether upon its feet, although rapidly approaching that condition. War, grave financial stress, some unforeseen demand for public funds in the interests of the public might suggest some such step, but we face to-day no such condition.

The progressive increase in royalty based on percentages of the price increment above the base level selling price of $18.00 is made subject to the result of governmental investigations and applied at the end of each five years, to hold for the next five years. Therein lies the great principle around which hangs this Bill; the principle that the Government, the people, and the lumbermen are co-operators in an industrial enterprise, the principle that by frequent re-adjustment based on the actual facts, timber royalty will keep pace with the growth in lumber values. In it lies not merely the great solution of the royalty question, but also the new principle of disposing of other public natural resources which will live.

Now, to take up the fourth provision of the Bill, which adjusts and fixes the rentals for the whole period.

''Why fix the rental?'' the open-minded uninformed man might say. ''Why not leave that open What's the use of tying it up for such a period?'' To such a man the answer is this: Every British Columbia lumberman is fairly entitled to have the rentals fixed during the period of the royal re-adjustment bill, and during the period that his profit is shared between the Government and him.

Coincident with its enactment, this Bill will increase the timber royalty by somewhere between $50,000 and $60,000. By 1924 if the annual lumber cut increases on an average at the conservative figure of 5 per cent per annum, and lumber goes up moderately to $21 per thousand feet, this Bill will have increased the royalty revenue to close on $2,500,000 a year.

According to despatches from London, Eng., leading timber agents there declare that the new British Columbian timber royalties bill, to which the newspapers have given so much prominence, will have but little effect on the English business in view of the fact that British imports of British Columbia timber is less than two per cent of the total.

It is reported that a large pulp, paper and lumbering business, to be conducted on a large scale will shortly complete negotiations which will enable the owners to start operations in the vicinity of the Transcontinental Railway, a short distance from Cochrane. The capital behind the scheme is said to be largely English. The proposal is to erect mill at Yellow Falls, fourteen miles south of the bridge which crosses the Mattagami River at Jacksonboro, and it is also proposed to do all the manufacturing of pulp, paper and lumber on the site, the freight charges being too high to send the material away.

NEW METHOD OF PREPARING PULP.

Carl Bache Wigg, of Berlin, New Hampshire, Patentee.
Description by Patentee.

U.S. PAT. NO. 1.084,244.

The invention has for its object the production of pulp by a novel method from straw, cornstalks and similar substances, which is suitable for use as a substitute for ground wood pulp, and may be used as ground wood pulp is now used in the manufacture of paper, as for example, in the manufacture of news-print paper, which pulp compares favorably with ground wood pulp in quality and in cost of production. My new method, however, is also adapted for wood and similar cellulosic substances.

My new method involves confining the cellulosic substance to be treated, usually in small pieces, or blocks, in a digester, then withdrawing the air from them, thereby producing a vacuum, in the digester, or, more strictly speaking, a partial vacuum, then pressing in sulfurous gas such as sulfur dioxid, ($SO2$), to bleach the pieces and to soften but not destroy the ligneous matter, then injecting a solution of sodium chlorid, a bisulfite liquor may be employed, but for ordinary purposes the solution of sodium chlorid is preferable, as it is well suited for the attainment of the desired result, i.e., retention of the ligneous matter, although its character is probably modified, but its weight is not substantially reduced. Whether the celulosic substance employed be straw, cornstalks or wood, I have discovered that when the air is withdrawn from it, a bleaching and softening gas may be pressed into intimate contact with the fibres composing it in such manner as to bleach them and also to soften but not to destroy the ligneous matter by which they are naturally bound together. The sulfurous or other gas may be pressed in say for one or two hours. The mass may be cooked in a solution of sodium chlorid for say two or three hours, which is usually sufficient, although it may be cooked for a longer or shorter period of time, according to the quality or grade of pulp which it is desired to produce. A finer quality of pulp may be produced by longer cooking. If a bisulfite liquor is employed in lieu of a solution of sodium chlorid the stock will be cooked for about the same length of time, and the resulting product will be a still higher quality of pulp. The expense of such treatment increases the cost of production. When the stock has been treated in accordance with my method it is washed, and if used as a substitute for ordinary ground wood pulp in the manufacture of news-print paper, further bleaching will not be required, but if it is desired for use for finer grades of paper it may be further bleached by a sulfurous gas or other bleaching agent. If used for news-print paper the stock when washed will be subjected to the action of a kollergang, disintegrator, grinder or refiner and then screened, as usual in the treatment of wood pulp. The resulting product when cooked in a solution of sodium chlorid is not cellulose, but is what might be termed a half cellulose, yet if cellulose is desired which is suitable for the finer grades of paper a bisulfite liquor will be employed and the stock will be cooked for a longer period of time.

The novel steps in my process consist in withdrawing the air from the cellulosic substance to be treated and then pressing in a bleaching and softening gas, thus to prepare the stock for cooking.

Ottawa Notes.

(Special to Pulp & Paper Magazine.)

Ottawa, Feb. 26.—A large incorporation at Ottawa was that of the Abitibi Power & Paper Company, incorporated, with $7,000,000 authorized capital, recently. The new company will take over the business of the Abitibi Pulp & Paper Company, Ltd., and will continue its operations, but will presumably pay more attention to the development and sale of power on a large scale. The company will have its headquarters in Montreal.

As usual, timber and paper interests are concerned in a lot of legislation, which has been introduced in Parliament already this session, and is now under consideration. Among the measures referred to is one fixing new regulations for floating timber on the Pacific Coast. It provides that any person finding stray logs floating in the sea and tidal waters of British Columbia may take charge of them. If the owner, being notified, does not reclaim them and pay salvage within 45 days of notification, the finder gets possession of them.

Another act is one which will affect pulp and paper mills which discharge any effluent into navigable waters or waters which flow into navigable streams. Every corporation, other than a municipality, which is found guilty of allowing to be discharged into such waters any sewage, offal or refuse, or any matter poisonous, noxious, decomposing, refuse or waste, will be liable to a fine of $200 and $20 per day additional for every day during which the offence continues.

The new ground wood mill of the E. B. Eddy Company, described as one of the largest and most modern in this continent, is now operating at 75 per cent. of its capacity, and is turning out about 90 tons of pulp per day. The reorganization of its whole power plant which the Eddy Company has been carrying out during the past six months, and as a result of which the firm will produce all the power necessary for its extensive operations, is also nearly completed. Two out of the three units are running.

Pulp Mill for Ungava.

That English capitalists are to establish pulp mills in Ungava territory was the interesting announcement made here last week. It came in the form of an argument before the Railway Committee of the House of Commons by counsel for the Ottawa and Ungava Railway, which was asking for an extension of time. In pointing out the importance of the proposed line, counsel stated that it would connect with pulp mills throughout the territory through which it will run, these to be built by British capital. The route will be from the north-west arm of the Gatineau River and thence crossing the Ashwapmuchuan, Mistassini, Peribonka, Bersimis, Outarde, Manicuagan, Pentecote, St. Marguerite, Moisie, Romaine, Natashwan rivers to Lake Melville or a point on the boundary between Quebec and Labrador near St. Charles River. The extension of time was granted by the committee on these representations.

Another line which will serve pulp and timber interests will be that of the Sudbury, Kepawa and Bell River Railway Company, among whose incorporators is Mr. John Lumsden, lumberman, of Ottawa. The head office will be at Ottawa, and the result will be from a point near Sudbury, Ont., eastward to a point near Kepawa Junction in Quebec, thence in a northeasterly direction near the Transcontinental Railway in Quebec where it crosses the Bell River.

Although the Montreal Board of Trade and other such organizations throughout the country will shortly unite in a huge delegation to the Government to have the construction of the Georgian Bay Canal—in which pulp and paper men are vitally interested—commenced at once, there is no liklihood of an immediate start being made, according to an announcement made in Parliament last week by the Minister of Public Works. A resolution was proposed by Sir Wilfrid Laurier with reference to the commencement of work on the big project and in the speeches in its support which followed on the part of members on both sides of the House, it was pointed out that the canal would give facilities for the transport of immense supplies of pulpwood in the district through which it will be cut. However, Hon. Mr. Rogers annouced that he would not act until he had received a report from a commission which he will appoint to go into the commercial feasiblity of the project, the enginering feasibility having already been determined. He hinted, however, that there was a strong possibility of the section from French river to Lake Nipissing—which would serve pulp and paper interests particularly—being gone ahead with in the near future independently of the remainder of the route.

FLAT OR ROTARY SCREENS.

(Abbr. Translation from "La Papeterie," by C. E. Bandelin.)

It is well known that new inventions meet with many difficulties, and that they are only slowly adopted by the industry, especially as there often exists a sentiment of distrust against everything new. The paper manufacture is among these industries, and many improvements are those introduced only with difficulty.

Among the numerous machines and apparatus used in the paper industry, the flat screen certainly has been the one least changed. In many mills the old flat shaking screen is still met with, and it is astonishing to see, how tenaciously old papermakers keep on with this imperfect device. This is perhaps due to the lack of success of certain new constructions, the inventors of which having promised wonders, which have not always materialised.

It is sufficient to look over the periodicals of the paper industry to find that there is no final opinion as to the advantage of one or another system, and an apparatus is seldom met with, on account of which the inventor's imagination has been more taxed.

The first paper machines had flat screens. According to Hofmann's Handbook on manufacture of paper, the paper mill at Weddersleben, in Germany, used a screen from 1829 for hand-made paper. Bryan Donkin, of London, later improved the device and used it in connection with the paper machine, which bears his name, and in spite of an incessant work to improve it, it still has the same inconveniences which Hofmann described 25 years ago. He said at that time:—

"The main fault with all screens of this type is, that "the knots and impurities remain on the plates, stick "in the slots, and obstruct the passage of the pulp. "The man in charge is obliged to scrape together in "one corner the screenings remaining on the plates, in "order to take them away. During this operation, "and notwithstanding all care, it cannot be avoided, "that part of the impurities is pressed through the "slots. The quantity of pulp passing through the "plates is increased after each cleaning, and the paper "then becomes heavier and less clean."

Another inconvenience is the formation of fibre bundles, more or less fitted together and called "cats," which often have a nucleus of impurities. In the case, that the pulp has not been refined in an absolutely regular manner and contains some long fibres, those fibres can settle across the bars separating two slots and cause the formation of "cats."

The author has for many years worked with the most different systems of flat screens, such as Goulds, Whites, Wogcs, as well as with the usual oscillating screens, and can state on acount of his long experience in the use of these devices, that the flat screen does not in any of its forms give complete satisfaction as to work performed, labor required or wear and up-keep.

Quite different is the case with the rotary screen. It was first brought out by Wandal in Reutlingen, Wttbg., about 1862, and has since then been improved over and over again. The both, most modern types, built by Lamort and Dietrich-Seybold, can be regarded as the most perfect form in which these machines have as yet appeared.

Lamort's screen is especially suitable for fine papers, particularly its double type, while the Dietrich-Seybold screens can be used for all goods. The D.-S. screen has a slowly rotating cylinder without any shaking. The pulp passes from the outside in and is pushed onwards by oscillating plates below the cylinders. The knots and impurities retained by the slots are continuously removed by a sprinkler pipe. The cylinder does not carry away any pulp, and it is impossible for the impurities to collect in form of a roll inside the cylinder, which is only half full with diluted and screened pulp.

The mill, where the author is employed, manufactures the most different grades of paper on six machines, viz. pergamyn, grease-proof, fine papers, exclusively from rags and without any ground woodpulp, envelopes, strong wrapping, manila, colored papers, cheap wrapping from cellulose refuse and old papers, etc., and for all these grades the rotary screen now mentioned gives complete satisfaction.

It has been possible with such a varied production to determine exactly the most suitable width of the slots, and the quantity manufactured in each case.

For all fine papers the slots are about 0.014 to 0.012 of one inch, and for inferior grades 0.018 to 0.017 of an inch. No difficulties need to be feared with such fine slots, and the following results as to the production of the rotary screen will remove all doubts in this respect. As an average, 22,000 to 26,500 lbs. of fine and envelope papers are obtained per 24 hours on a machine with a width of 7.5 ft. of cut paper with slots of 0.014 to 0.012 of one inch, while slots of 0.018 to 0.017 of one inch would let through 26,000 to 31,000 lbs. of inferior grades. The screening is of course perfect with so narrow slots.

Some devices must, of course, be arranged in the riffler in order to catch floating impurities and to facilitate the work of the screens. This is easily done and it can be said that all pulp, which does not pass through a D.S. screen, will not pass through any flat screen.

Another advantage of the rotary screens is also appreciated by many manufacturers; viz., the nearly complete non-appearance of rosin and grease spots on the wire. This advantage is especially valuable for manufacturers of this grade of inferior quality. The disappearance of such spots is explained by the fact that the rosin and grease are floating inside the screen. The cylinder, which turns slowly in the pulp, carries these floating particles away, when it moves upwards, and the spray pipe washes them away.

Every practical papermaker knows that repeated cleaning of the wire has an obnoxious influence on the production as well as on the length of life of the wire. The suppression of such stops has had for consequence an increase of about 10 per cent in the production. The wires also last for five or six weeks, instead of three to four. This improvement certainly depends upon a better screening of the pulp, as the old flat screen with its slots of 0.30 of one inch let the knots and sheaves pass, which afterwards made marks on the wire. These marks, by friction on the suction-boxes, quickly put the wire out of commission.

It may be added, that the expenses for lubricating and up-keep are so nominal with a rotary screen, that it is also in this respect very superior to the flat screens.

LINEN PAPER.

Special papers are more in demand every day, and in making, say, an imitation of linen, it is absolutely necesasry to keep the purpose in view through every process, from the hollander and pug mill to the calendering and stamping. Unless the paper has been specially made, no stamping or other ornamenting process will be of any avail.

All paper to be linen-stamped must be tough and strong, but must have a considerable degree of softness, as elasticity is necessary for the success of the stamping. Hence a proper mixture of pulps and proper grinding are required, and, above all, the use of soft water. The best results are got with equal parts of hard and soft pulp, and a certain amount of filling. The following is a useful recipe:—

Sulphite pulp	30 per cent.
New white first class bleached cotton pulp	30 per cent.
Bleached leafwood pulp	30 per cent.
Filling (asbestine, blanc fixe, China clay)	10 per cent.

The sulphite pulp must be selected with care, and not too much of it may be used, or the paper gets hard; and the rags for the cotton pulp must be well sorted, or else the best pulp-strainer is useless. The wholestuff hollander must be watched to see that overgrinding does not impart a parchment-like character to the paper. The sulphite and cotton pulps should be hollandered separately.

When the pulp reaches the wire, it must be remembered that it is not exactly greasy, so that there must be a strong shake with a moderate stroke. Stamped papers are generally thick sorts, say about 85 grammes per square metre. The suction boxes must not draw too strongly, and the web must not be too damp when it reaches the dry end, so that the press-rolls must be ample, so that the pressure is small, and felt marks are avoided. The number of drying cylinders must be considerable, so that the drying is uniform. The best speed on the Fourdrinier is from 40 to 60 metres per minute, and the width of the wire should not exceed 2 metres.

On leaving the dry end, the paper is damped for stamping. The damping requires especial care, for it must be uniform, and must not be excessive, or the lustre of the paper will suffer. After damping the paper should be left overnight in a cool place for the moisture to distribute itself uniformly.

At the present day there are two sorts of stamping. One is produced on the goffering machine, with rollers of the best chilled cast iron, engraved to imitate the structure of linen, from the finest batiste to the coarsest fabrics. In any case, the pressure must be easily regulatable, and the engraved lines on the rollers must be kept clean. The paper should not contain more than 10 per cent. of filling, and the occurrence of hard grains likely to damage the paper and the engraving of the rollers must be carefully avoided. The stamping can be done on one or both sides. In the former case the paper must run between an engraved cylinder and one thickly covered with paper.

In the latetr case it runs between two engraved cylinders. Papers stamped with engraved cylinders can be recognized by two tests: their unequal transparency and the constant repetition of the same fibre pattern. They are generally rough on the surface, and therefore not easy to write on with a pen. This defect can be partly remedied by calendering, but not entirely without destroying the linen pattern. Papers stamped with engraved rollers are used mainly by bookbinders and for wrapping.

The second method consists in pressing a linen fabric on to the web. The paper is passed between two rollers wrapped in linen, and receives the impression of the fibre on both sides. One difficulty is to avoid creasing and distortion. The development of a crease or a tear in the wrapping necessitates its total renewal. Another is that a closely-woven fabric is necessary, and the pressure soon flattens it so that it makes little or no impression on the paper. The first difficulty is preventable almost entirely by careful examination of the fabric before use, and accurate wrapping of it on to the cylinder. The best way to avoid the second difficulty is to substitute flat plates for rollers to give the impression. The method is expensive, because rollers are needed as well as plates, although the rollers are not, of course, engraved, and because the paper has to be stamped sheet by sheet instead of passing in a continuous web, to be cut up as required afterwards. The sheets and steel or zinc plates covered on both sides with linen, are made up into piles of 20 to 25 plates alternating with sheets of paper, and the piles are rolled to press the pattern of the linen into the sheets. Instead of having a pile, single pairs of plates or several pairs side by side can be put through the rollers. This avoids the difficulty of getting uniform pressure throughout the whole thickness of a pile. Two women workers can in this way stamp 9,000 to 10,000 sheets of 60 by 46 c.m., and weighing 80-90 grammes per square metre, daily.

Whether in web or sheets, the paper should never pass more than once through the machine. Once ought to be enough if everything is in proper order, and a second passage will infallibly confuse the two. The pressure must to some extent be regulated by the transparency required; the greater that is, the heavier must be the pressure. Then, again, much pressure is needed for getting deep impressions, especially on comparatively inelastic papers. The adjustment of the pressure, in fact, demands much skill and experience. Writings require a slight calendering between blank zinc plates after stamping, if the relief of the pattern is too great for them to be written on comfortably.

As regards the plates used for stamping, zinc plates are preferable in working with piles, steel plates for working with separate pairs of plates, as zinc plates are then likely to be bent or crushed at the edges. A bent plate can be straightened, but one with a crushed edge is spoilt beyond hope. Much, of course, depends on the way in which the press is fed. A pair of plates or a pile of pairs must enter with an edge parallel to the rollers, and not corner first, for example.

It is greatly conducive to the life of the plates and also to that of their linen covering, to make that double, using a coarser fabric next the metal and a finer fabric to imprint the paper. Both fabrics must be free from weaving faults, especially from knots or holes, and also from trace of size or filling. The paste used is always made with wheat starch, mixed with about a quarter of its weight of potato flour. The plates should extend about an inch beyond the paper all round for single sheet printing, so that the workman can take hold easily without touching the paper. When the linen has been fixed on to a plate, it is of great importance that it should not be used until the paste is perfectly dry, which will take at least twenty-four hours in a warm, dry room. Experience has shown that if the stamping is done with plates which are not perfectly dry, the relief is much more likely to be worn down by handling or even by the sheets being piled up in stock.—Papier Zeitung.

THE DANDY ROLLS AND ITS USES.

Now that the cost of making paper is steadily rising, and competition in paper-making is getting sharper, every paper-maker tries to increase his output, without diminishing the quality of his products. The dandy roll is an important factor in the value of a paper. It has been proved over and over again that other things being equal, that papers made with a dandy roll are better, especially in regard to strength, than papers made without one, provided, of course, that the roll is in good order. Hence the use of a dandy roll is especially advantageous with kraft papers. It is therefore of importance that every paper-maker should use dandy rolls proper for the paper in the making, without too much regard to the cost of them.

A special advantage of the dandy roll is that it increases the sizing quality of the paper, especially with thin papers, an important fact in view of the present high price of rosin. Every paper-maker knows that all irregularities in the flow of pulp on to the wire and in the shake interfere with the felting of the fibre, and make an unlevel web, made still more so by the action of the suction boxes. An important function of the dandy roll is to level up the web by its pressure. It is obvious that if the web is left in its unlevel state, it will vary in weight from square yard to square yard, and will show different sizing qualities at different places.

It is requisite to run the dandy roll in exact correspondence with the speed of the machine, especially with the very wide machines now in use. A paper-maker ordering a dandy roll must state exactly the thickness of the paper and the speed of the machine.

Proper work with the dandy roll depends also on the preparation of the stuff in the hollander. Pulp must be supplied neither too short nor too coarse. The pulp must felt well enough on the wire to resist the tendency to cling to the dandy roll. This tendency is the chief danger with ribbed and water-marked rolls, and causes waste of time while the attendant is putting matters right. He takes his own time to do it. This tearing out of fibres from the web by the dandy roll is due to badly hollandered pulp. With a heavy dandy roll, actual holes may be torn in the paper, and if the roll touches the wire, both of them wear rapidly.

This last observatoin obviously suggests that the dandy roll should be as light as possible, especially with wide rapid machines. English makers of these rolls are now copying their German and American confreres in this respect. It is true, of course, that a long roll must be comparatively heavy, but it is easy to have a system of counterpoises, so that just so much of the weight as is required to produce the desired effect comes upon the web. By means of this device, together with spring-bearings, the pressure of the dandy roll can be regulated to a nicety from its full weight downwards.

The place wheer the dandy roll should be put over the wire depends on the purpose it has to fulfil. For vellum papers it should be just behind the first suction box. If, on the other hand, it has to make a water-mark, it must be nearer the dry end.

Another point to be considered is the wrapping of the dandy roll. Its fineness must be arranged according to the work. The fineness must not be too great for thick papers, to prevent distortion, but for thin papers the fineness should be as great as possible. The relief of the water-mark is also of importance. It must be greater for thick than for thin papers. Similar remarks apply to dandy rolls for ribbing paper instead of water-marking it. The thinner the paper, the finer the rib-making wires must be, and vice versa. For fine papers, the dandy roll must be made of bronze or brass.

Although for water-marks there is not much question of wear with all sorts of dandy rolls, yet the marks and pictures soldered on to large dandy rolls are much less subject to wear than on small rolls.

In order to get an exact water-mark always, the dandy roll must be kept clean. The alum in the size attacks the dandy roll wires unless this is done, and the wires then make imperfect impressions. If there is any of the clinging tendency above spoken of, the reliefs of the dandy roll should be smeared with petroleum or turpentine.

Many liquids are squirted on to the dandy roll and wire to clean them, such as water, turpentine, petroleum, bisulphide of carbon, caustic soda lye, solutions of carbonate of soda or soap, and dilute sulphuric acid. All of these, except the last, do not hurt the roll-covering, but the case is very different with sulphuric acid. Especially on Sundays, when, certain countries excepted, the machines are standing still after having been cleaned, the acid gets twenty hours to act on the metal, and even the best bronze will not resist it long. Hence sulphuric acid should not be used for cleaning dandy rolls.

As soon as the dandy roll is lifted off the wire it should be rinsed with a 3 to 4 per cent solution of carbonate of soda, and the water-mark wires should be cleared with a blast of steam, to clear the crevices from scraps of pulp. This cleaning becomes much more difficult if it is delayed, as the pulp dries on the wires.

Care must be taken that letter-marks on the dandy roll have no sharp edges to injure the web pasisng below them. These edges will, of course, cut deeper the heavier the pressure of the dandy roll on the web.

Another point is to see that the bearings of the dandy roll run true. The writer had a curious proof of the truth of this apparently obvious proposition. A dandy roll which had been causing trouble was transferred to another machine, where less important papers were being made. It then acted perfectly, and it was found that the bearings in which it had worked in the first machine were badly worn, while those to which it was transferred, the machine having been less used, were nearly as good as new. Bad bearings make the roll catch up fibre from the web in its jerky movement, and often causes holes in the paper.

The dandy roll must be kept damp, and this is best done with two jets, one of water and one of steam. The steam jet should be as far below the dandy roll as possible, and on the pulp-strainer side. The steam also helps to destroy blisters in the web, and assists the action of the suction boxes by its heat.—Zentralblatt.

WORKING-UP WASTE PAPERS.

The treatment of waste paper is different according to whether a mill works up scraps regularly, or only now and then. In the latter case only the best sort of scraps is used. In the former case all sorts are worked up except the dearest.

Waste paper has become an important article of commerce, and there are special sorting establishments which will undertake to maintain a supply of any particular kind of scrap. As many as 40 different classes are made, and these are again subdivided according to colour.

The sorting and working up of the waste in small quantities for mixing in small proportions with whole stuff presents no difficulties, as no special machinery is wanted. The case is different when 10 tons or more of waste are used every year, and the sorting of such huge quantities cannot be done economically in a paper mill.

Large quantities mean large warehouse space, for the scraps must not be kept in the open air. A good airy shed is the best store-room, as it shelters the bales from wet while allowing free access of air. It should be as near the shop where the scraps are treated as convenient.

The best boilers for waste paper scraps are the spherical form, and the sorting-room should be over the boiling-room. For sifting out dirt hand sieves can be used or an endless travelling screen. The sorting must depend on circumstances. Thus in sorting scraps with a view to making coloured paper, more attention must be paid to quality than to colour. The boiler should hold two tons of paper or more. It cannot well be too large. One ten feet in diameter is none too big.

It is economical to use an old boiler, as it is not used for heating, but simply to soak the scraps. If heat is employed, the size in the paper scraps will be removed entirely. Some is unavoidably lost, but whatever is left makes economy in the after-sizing of the new paper into the composition of which the scraps enter. The boiler can be filled loose with the waste paper, or it can be squeezed in if it is necessary to make the boiler take up a large quantity. It must, however, be remembered that wood papers swell, so that they, or scraps containing a large proportion of them, must not be packed too tight. It is essential that the rouser in the boiler should not be interfered with in its action. Three or four hours are required in the boiler, which is revolved about five times per minute. This treatment facilitates and shortens the subsequent pugmill work materially, and as the largest spherical boiler takes up no more than five horse-power—much less than a pug-mill—the economy of the previous treatment is obvious. No good results can be expected if the soaking is omitted.

As a substitute for the pug-mill, the kneading machine is not to be recommended.

The hollander must not receive the stuff too thick from the pug-mill, or the pulp will get too greasy. This danger is particularly imminent with long hollander rolls of large diameter, which work very rapidly.

As regards the work on the wire, the whole stuff must be greasy to prevent the water from running off too freely. It is often a good plan to warm the pulp a little, especially in making thick papers. Four suction boxes are used, two with suction and two without.

The felt of the upper couch roll may be an English unwoven one, if the paper has been well sorted beforehand, so that there are no coarse impurities. There ought to be three wet presses, with felts not too close, but not loose enough to mark the web.

The dry end should be ample, as gradual drying is advantageous. Papers to be satined on one side only should not come too wet to the drying cylinders, or the moisture will escape slowly and unevenly, and creases will be produced. A long wire is almost invariably necessary, if the machine is to be run at any reasonable rate.

We may now allude to some of the later ideas, some patented and some not, which are connected with using waste paper over again. Most of the patented processes involve the use of reagents for removing printer's ink and bleaching. Hence they are far too troublesome and expensive. It is far better—in fact, the only way—to sort the waste paper, and to use printed stuff only for making coarse coloured new papers.

In conclusion, it is to be remarked that supercalendering is advisable, when possible, for papers into the composition of which much old waste paper enters. The calendering conceals the look, indescribable in words, which such papers are too prone to manifest, and which the expert remarks immediately.

Under present-day conditions, it is practically impossible to make wall-paper, even the best kinds, without the use of old scraps. The case is different with wrappings. No strength is wanted in a wall-paper, but a packing paper does require a certain amount. Hence the use of old paper in its manufacture requires care, and respectable makers of wrappings, who are the majority of the trade, take care to use only the best unprinted white scraps, and them in not too large a quantity.—Papier Zeitung.

Mr. J. K. L Ross was elected to the vacancy on the Laurentide board caused by the death of his father, the late Mr. James Ross. Mr. Ross is at present in Bermuda.

BRAZILIAN WOODS.

Their Utilization For the Manufacture of Wood-Pulp. Woods Suitable for Pulping.

The following are the native names of the species which are best adapted for that purpose. It is to be regretted that neither in French nor in English is there any name for so many species:—Lenha branca, morceguinho, cachete bicuyba, imbira guiaba, gindyba, araca, anda-assu, tatu, barriga d'agua, almecega, catinga de porco, pindahyba, imbauba, aca, caja, canella jacu, canella gosmenta, taroma, gotrana, mulungu, sapucaia, figueira do campo, conde, louro, imbriussu, guaxima, bacurubu, palmito doce, bainha-capada, pinho do Parana.

Most of these are of very rapid growth, and at the age of seven or eight years reach a diameter equal to that of our European resinous woods at 25 years. Nearly all of them have a white or very light-coloured physical texture, with long flexible fibres. Apart from the pinho and the almecega, none of them contains resin. Almost all attain a height of 20 to 40 metres (66 feet to 112 feet) and a diameter of 75 centimetres to 2½ metres (say 30 in. to 100 in.), with the exception of the guaxima, which is a shrub.

Analysis of Some of the Woods.

	One month after felling.			Dry timber.	
	Water.	Ash.	Cellulose.	Ash.	Cellulose.
	p.c.	p.c.	p.c.	p.c.	p.c.
Canella gosmenta.	34.22	0.71	48.02	1.08	72.99
Canella jacu..	38.61	0.61	43.75	1.00	71.26
Taroma	32.94	1.29	46.07	1.93	68.70
Gotrana	33.32	0.75	45.75	1.12	68.61
Mulungu	54.53	1.24	30.99	2.74	68.16
Imbauba	28.92	0.93	47.71	1.31	67.12
Sapucaia	33.57	0.38	44.25	0.58	66.61
Figueira do. campo	39.33	1.54	40.39	2.54	66.58
Conde	31.67	0.79	44.31	1.15	64.85
Imbirussu	40.76	0.81	37.52	1.36	63.28
Guaxima (bark)	54.82	5.38	12.77	11.90	28.27
Ditto (wood)	43.56	1.03	34.81	1.83	61.67
Bacurubu	23.13	1.57	46.54	2.07	60.55
Palmito doce	30.43	0.83	40.50	1.19	58.22
Bainha-capada	41.77	1.05	31.36	1.80	53.86
Louro	19.37	2.74	52.17	3.40	64.70

Volume and Distribution.

There have been carried out a large number of estimates of the volume occupied by these white woods. In a general way it may be said that it decreases in inverse ratio with the altitude in tropical forests. Thus the writer has measured in forests at an altitude of less than 100 metres 550 cubic metres of white wood per hectare (7,862 cubic feet per acre), while at 250 or 300 metres (say, 825 to 1,000 feet) the proportion is no more than 200 cubic metres (2,860 cubic feet per acre). At a height of 500-600 metres (say, 1,700-1,900 feet) it falls below 100 cubic metres per hectare (1,430 cubic feet per acre). These figures relate to squared trunk wood; no account is taken of the branches or of the exterior wood, which by themselves form a volume equal to nearly one-half of that of the trunk-wood.

The specific gravity of all these woods is very variable, ranging between 0.350 and 0.750, so that on an average a cubic metre would weight 550 kilogrammes (1,212 lb.) and would yield about 200 kilogrammes (44 lb.) of mechanical pulp, or 125 or 150 kilogrammes (275 lb. to 330 lb.) of unbleached chemical pulp.

Conditions of Exploitation.

The conditions of exploitation naturally depend upon the topographical situation of these forests. It is possible to come to an agreement with the proprietors or with the companies which exploit the cabinet woods only, or to acquire certain of the forests and work them as a whole. On this would depend the net cost per cubic metre of wood delivered at the mill. It is impossible to state an average value per cubic metre; the writer will merely give, as a guide, an example corresponding to an industrial exploitation of relatively little importance, of which the mills are situated at a short distance from a navigable river connected with a seaport.

Whether the wood is worked by the enterprise or whether it is purchased from the exploiters, let it be supposed that its cost, delivered to the mills in the proximity of the river, is 3f. 50c. (2s. 11d.) per cubic metre. Let it also be assumed that the cost of labour is 6f. (5s.) per day of 10 hours, with 300 working days per year. This being so, let us calculate what would be the cost price of 100 kilogrammes (220 lb.) of mechanical pulp for an output of 20 tons of pulp per day. This works out as follows:—

Estimated Cost.

Motive power: 1,500 h.p., produced by burning wood-chips, etc., the net cost of which would be 1f. (10d.) per cubic metre.

	F.c.
Of this fuel 60 cubic metres per day would be necessary=60f., or for 100 kilogrammes of pulp	30
For 100 kilogrammes of pulp ½ cubic metre of white wood is sufficient, or	1.75
Labour: in mill, 50 men at 6f.=300f.=for 100 kilos	1.50
Land transport, 20 men at 6f.=120f.=for 100 kilos	60
10 mules at 2f.=20f.=for 100 kilos	10
River transport (100 h.p. steam barge, 400 tons, with crew of 10 men) would cost about 20f. per 20 tons manufactured=for 100 kilos ..	10
Lighting oil, etc.=25f. per day=for 100 kilos. ..	12
Management and staff=150f. per day=for 100 kilos	75
Amortization of capital (800,000f. amortized at the rate of 15 per cent. per annum, or per working 400f.=for 100 kilos	20
	F.5.42

This cost of F.5.42 per 100 kilogrammes (=5 3-20d. per 220 lb) is for pulp delivered at the port of exportation. To this must be added:

Transhipment aboard steamer, per 100 kilos..	20
Export duties, 10 per cent. ad valorem	55
Freight from Brazil to an English port, 20s. per ton, or for 100 kilos	2.50
Cost of 100 kilos, pulp f.o.b. at an English port	F.8.67
The present selling price of pulp per 100 kilos. being	13.00
Theer is a net profit of	F.4.33

If this calculation be correct the annual profit should be 260,000f. (i.e., 3s 5d. per 220 lb., or £10,292 per annum).

Capital Necessary.

The capital necessary for this enterprise is made up as follows.—

Machinery, 1,500 h.p. (for wood fuel)	F.150,000
Apparatus: rasping-machines and accessories ..	200,000
River steamer, 400 tons capacity	125,000
Barges	200,000
Transport and setting up	50,000
Sundries and unforeseen expenses (the land is given free)	75,000
	F.800,000
Floating capital	400,000
Total capital	F.1,200,000
	or, say, £47,500

The profit would thus be about 21 per cent on the total capital.

It will be remembered that in the foregoing calculations it is assumed that the wood is supplied by an exploiter at the price of F. 3.50 per cubic metre delivered at a certain distance from the mills, and that the pulp manufacturers have only to load it and transport it by a Decauville light railway to the factory. If the forest were to be exploited by the manufacturers themselves the business would be rather more complicated.—London Times.

PINE OIL OR LIQUID ROSIN.

By H. BERGSTROM.

(Abbrev. Transl. from "Svensk Papperstidning," by C. E. Bandelin.)

It is well known that a liquid "soap," floating on the black lye, is obtained in the soda pulp process, when pine wood is digested. This "soap" has already been the object for investigations, and so-called "liquid rosin" is at present generally prepared from it by treatment with acid sulphates or acids. This soap mainly consists of sodium-salts of higher organic acids, which consequently are constituents of all the liquid rosin.

A light yellow oil, with a bottom sediment of white crystals, which may be separated from the oil by pressing, is obtained together with a small quantity of a dark-colored, very volatile liquor, when the brown liquid rosin is distilled in vacuo. These crystals consist of rosin acids, which crystalise in an alcoholic solution as triangles or prisms with corners cut off obliquely. A brittle, yellow to brown rosin is obtained, when the purified crystals are melted, and can be used as common rosin for size.

The slowly drying oil obtained from the vacuum-distillation contains rosin acids in solution together with higher fatty acids and indifferent substances. Palmitic acid has been found among these fatty acids, oleic acid very probably occurs among them. When superheated the oil gives sebacic acid in great quantities. Besides some acid of the linolene series probably is present.

The indifferent substances have as yet not been thoroughly investigated. The first destillate from the destillation in vacuo is rich in indifferent substances, among which a terpene has been found.

Phytosterine, an alcohol, has also been found, which in vacuo distils without disassociation at a temperature above 360 deg. C., and which generally occurs in vegetable fat. This phytosterine has been prepared directly from the soap, not from the pine oil.

The raw material for the pine oil, the soap, contains always some black lye, which at the disassociation with acid forms lignine, which, however, may be separated from the oil by mechanical means. Pine oil consequently contains:

Indifferent substances.
Phytosterine (in the soap).
Palmitic Acid.
Oleic Acid (very probably, but not directly shown).
Acids, belong to the Linolene series (do.).
Rosin Acids.

Small quantities of lignine substances may also occur as occasional constituents as well as water.

The researches, the results of which now have been outlined, must, however, only be regarded as preliminary, and the pine oil can, of course, also contain other ingredients besides the now mentioned substances.

The quantitative composition of the pine oil is varying depending upon the quality of the digested wood. The following average figures have been obtained from different samples:—

	P.c.	P.c.
Unsaponifiable.	6	10
Rosin Acids.	35	50
Fatty Acids	40	59

Palmitic acid was found present, but amounting to less than 5 per cent of the pine oil. To these analyses may be remarked, that under the circumstances the results obtained by methods used for mixtures of known substances, must be taken somewhat cautiously.

The pine oil from surface wood, for instance slabs, is relatively rich in fatty acids, while inside wood from the same tree gives a pine oil more rich in rosin and thickly flowing. Certain kinds of pine in the Southeastern States don't contain any or only small quantities of fat. Such wood gives a nearly solid rosin in the soda pulp process, consisting mostly of rosin acids.

At present the pine oil is usually sold as obtained from disassociation of the soap. It is, however, probable that a further rectification of the oil would be advantageous on account of the price paid and with the now available knowledge of the composition of this oil.

GLYCERINE IN PAPER.

Sindall and Bacon.

The use of glycerine is resorted to in the production of certain types of paper, notably those which need to be slightly hygroscopic and capable of retaining some moisture. Some of the so-called dry copying tissues depend for their qualities on the presence of hygroscopic substances, amongst which glycerine takes a foremost place. Chlorides of zinc, calcium and magnesium are instances of metallic salts which absorb moisture on exposure to the ordinary atmospheric conditions.

The qualitative tests by which the presence of glycerine may be detected are of a simple character, but the quantitative estimation of the actual amount present is a more complicated process.

The method of detecting the glycerine is based upon the following reaction:—When an alcoholic solution of phenol-phthalein is added to a solution of borax the rose red colour obtained is discharged by glycerine in the cold, and restored on heating.

The solutions employed for this test are as follows:

(1) A half per cent. solution of borax obtained by dissolving 1 gram of borax in 200 ccs. of water.

(2) A weak alcoholic solution of phenol-phthalein obtained by dissolving 1 gram of phenol-phthalein in 100 ccs. of alcohol.

(3) The solution containing glycerine which in the case of a blank test may be made up conveniently by adding 1 gram of glycerine to 100 ccs. of distilled water.

The test is applied by adding to 2 cc. of the borax solution a drop of the phenol-phthalein solution so as to produce the well-known rose red colour. Sufficient of the glycerine solution is slowly added until the colour is completely, or almost completely discharged. If the mixture is then heated the red colour reappears, and on cooling off it is again discharged.

The distinct reaction can be obtained when 2 cc. of a 2 per cent. solution of glycerine is used. The complete discharge of the colour depends partly on the use of a very small quantity of the phenol-phthalein solution, and partly upon the quantity of glycerine solution added. Since 2 cc. of a 2 per cent solution of glycerine corresponds to 0.04 grams of glycerine, the reaction is a delicate one, and it can be utilised for even smaller quantities.

Hence in the case of a paper containing 0.25 per cent. of glycerine it would not be necessary to extract a very large quantity of the paper in order to obtain a reactive quantity of glycerine. Thus 20 grams would yield 0.05 grams of glycerine, and if this were extractted and obtained in a fairly concentrated form, the extract would respond to the test.

Some precautions are necessary in getting the glycerine in a properly concentrated form from paper in which it is present. The glycerine is volatile in the presence of water, and if paper containing a very small proportion is extracted with a large quantity of water, with the idea of evaporating the water so as to obtain a concentrated solution, some of the glycerine is lost during the process of evaporation.

The following plan may be resorted to as a means of extracting the whole of the glycerine in a given weight of paper, using a minimum amount of water. If, for example, it is necessary to take 20 grame of paper, the 20 grams is cut up into small slips and divided equally into five lots of 4 grams, each lot being placed in a test tube. The first 4 grams is covered with distilled water and heated on a water bath. The liquid is poured off into test tube No. 2, the paper in No. 1 being covered with a second quantity of distilled water. The solution from No. 2, after warming, is transferred to test tube No. 3 containing the third lot of 4 grams, while the solution from No. 1 is poured off again into No. 2. In this way, by gradual transferring the solution from tube to tube, the whole of the glycerine is obtained in a small quantity of water, and the reactions may then be found as described, without concentrating by evaporation.

The method described is probably the simplest which can be applied in the ordinary way, but as confirmatory tests others are available. Thus Reichl recommends heating cautiously to 120 deg. C. a mixture of a fairly strong aqueous solution of glycerine with fused phenol and an equal quantity of sulphuric acid. A brown solid mass is produced which, after cooling and dissolving in ammonia, produces a carmine red colour. Substances which are easily carbonised by sulphuric acid must in this case be absent.

Another test is based on the decomposition of glycerine when evaporated with acid potassium sulphate and the subsequent distillation of the mass. Acrolein is formed by this reaction, and the distillate can then be tested by the well-known Schiff's reagent. This reagent is prepared by decolourising a dilute solution of fuchsine or rosaniline with sulphurous acid. When the distillate is brought into contact with Schiff's reagent the red colour is restored. This reaction is also characteristic of formaldehyde.

Either of these two methods can be used to confirm, if necessary, the indications afforded by the simple test with borax.—"The Paper Makers' Monthly Journal."

PULP AND PAPER NEWS

The Inland Pulp and Paper Co., Thorold, Ont., which recently acquired the business and plant of the Colonial Wood Products Co., have orders on hand which will keep the mill operating to full capacity for many months. H. B. Eshelman is the manager. It was some time ago intended to build an extension on the land of the company to the south, but as the new Welland Canal construction has taken up fifteen acres out of the twenty-eight owned, the matter of any additions has been held in abeyance.

At the annual meeting of the Interlake Tissue Mills held in Toronto on Feb. 18, satisfactory reports were presented for the past year. The plant has been in operation at Merritton only about twelve months, but many special lines are being produced in toilet and decorative tissues, light weight wrappings, crepe napkins, sanitary crepe towels, tablecovers, and special tissue lines for wrapping fruit, brass beds, etc. All the old officers were re-elected as follows: President and Manager, George Carruthers; Vice-President and Treasurer, I. H. Weldon; Secretary, S. F. Duncan.

The annual meeting of the Provincial Paper Mills Co., Limited, who operate the Barber Paper and Coating Mills at Georgetown, the Montrose Paper Mills, at Thorold and the St. Lawrence Paper Mills, at Mille Roches, Ont., was held in the head offices in Toronto last week. The reports for the year showed that business had been well maintained, considering the depression which has existed and the fact that the output of the company was increased by some fifteen tons by reason of the erection of the new plant at Thorold. The outlook was regarded as very promising. The mills of the company now produce about seventy tons per day of book, bond, writing and ledger papers in addition to som eight tons of coated stock. The officers elected were: President, I. H. Weldon; Vice-President, T. A. Weldon; Secretary-Treasurer, S. F. Duncan; Directors, S. B. Monroe, G. R. Copping and Ralph Emery. After the business proceedings, the members were entertained to dinner at the National Club. The company will remove into new offices in the Bell Telephone Building, which are being vacated by the Toronto Harbor Commissioners, this month.

The annual meeting of the Lincoln Paper Mills Co., Limited, was held at the company's office in Merritton, Ont., recently. The usual gratuity of six per cent was voted to the employes of the mills, based on their individual earnings during the past year. Considering that trade generally has been a little quiet, very good reports were presented for the past twelve months. The following officers were elected for the current year: Welland D. Woodruff, president; A. S. Woodruff, vice-president, and W. M. Shea, secretary-treasurer.

J. B. Beveridge, manager of the Dryden Timber and Powewr Corporation, Dryden, Ont., has returned from a business trip to Chicago, and other western cities. It is expected that the plant at Dryden, which has been undergoing extensive alterations with a view to increasing its capacity of sulphate pulp and building papers, will be ready to ship about the middle of the present month.

W. Grierson, manager of George Newnes, Limited, the London, Eng., publishers, along with Mr. Bathgate, a director of Messrs. Pearson, Limited, spent a few days in Toronto recently. Mr. Grierson was investigating the improvements to machinery in connection with the magazine publishing business, and says that the circulation of British periodicals is greatly increasing in Canada.

There are many rumors heard that Northern Ontario is to see remarkable development in the pulp and paper line at an early date. The Northern Ontario Pulp and Development Co. has been formed with head offices in Toronto to carry on operations in pulp wood, lumbering and other lines. The capital stock of the company is $150,000. There is also a report that Toronto and other capitalists may erect a new sulphite plant near Cochrane during the coming year. Word also comes from Cochrane that a large pulp and paper and lumbering business is to be conducted at Yellow Falls, fourteen miles south of the bridge which crosses the Mattagami river at Jacksonboro on the line of the Transcontinental Railway. It is reported that the capital behind the proposition is largely English and that, for some years past, representatives of the concern have been inspecting the country for many miles west of Cochrane studying water powers and timber resources. It is understood that negotiations are now well advanced but, in the meantime, the promoters refuse to divulge anything very definite. It is known that engineering companies have been preparing preliminary plans for some time for a large pulp and paper proposition, but whether anything material will develop in the near future will, of course, largely depend on the way trade opens up this spring and the recovery in money market conditions. The number of new industrial concerns, which were granted a charter in the Province of Ontario during the past week was twenty-six and the total authorized capital was $3,500,000, which would point to renewed activity in business in the near future.

The Holden-Morgan Co. of Toronto, manufacturers and patentees of the Holden-Morgan bread wrapping machine, which is said to be the only one in America which will wrap bread automatically, with any kind of paper, have sold out half of their interest in the patent rights for the United States, to Standard Wrapping Machines, Limited, Toronto, who control the foreign output and patents, for one hundred thousand dollars. The Holden Morgan Co. still retain fifty per cent of the stock in Standard Wrapping Machines, Limited. The new invention will be manufactured on the other side, and many inquiries are already coming in. Holden-Morgan Co. will shortly place on the market an automatic hand wrapping machine for the use of smaller bakers. Paul Stearns, of the Atlas Baking Company, Milwaukee, who is the father of bread-wrapping on this Continent, was recently in Toronto, and placed orders for the new machine.

The Bertrand Lockhart Lumber Co., Limited, has been granted a charter with head offices in Port Arthur, and a share capital of seventy-five thousand dollars. The company is empowered to purchase, sell and deal in timber limits and timber locations, lumber, building materials, ties and pulp wood. The incorporators are: Allen G. Beaman, John H. McLennan, Joseph P. Bertrand, Herbert A. McKibbin, and William Marrigan, all of Port Arthur.

At a meeting of the Executive of the Great Waterways Association, which was held recently at Berlin, Ont., one of the matters discussed was that the water available at Niagara under present treaties is practically now all apportioned among the different power companies and that, by the end of the present year, the Ontario Hydro-Electric Power Commission will be using eighty per cent of its available supply. Aside from an increased supply under new arrangements, the extension of the Hydro-Electric Commission's service to new municipalities and for farmers and for radial railways would be impossible, and the municipalities at present supplied from Niagara would be forced largely to go back to steam or a dual service. In addition to the great expanding need of the Niagara zone, it is realized that the power possibilities in connection with the enlargement along the St. Lawrence river would convert that section also into a great electric manufacturing district. A general deputation from the districts affected will go to Ottawa at an early date.

Fire recently visited the premises of E. H. Harcourt & Co., publishers and lithographers, Toronto, doing several thousand dollars damage. Only the existence of a fire wall, which surrounded the furnace where the fire started and which extended to the roof, prevented the destruction of the whole establishment. The loss was principally on paper, machinery and lithographers stones. Some valuable government maps were also destroyed.

R. M. White, of Toronto, who is a son of Aubrey White, Deputy Minister of Lands, Forests and Mines for the province of Ontario, has been appointed manager of the Equitable Trust Co. of London, England. He left last month to take up the duties of his new position. The Equitable Trust, the President of which is Sir Max Aitken, M.P., is the name of the merged companies, the Western Canada Trust and the Canadian and Empire Investment Trust. It has been decided to increase the capital seven hundred thousand pounds and to broaden the scope of operations by making investments elsewhere than in Canada. Mr. White, the new manager, is only twenty-seven years old.

J. F. Ellis of the Barber, Ellis Co., Limited, Toronto, and wife, sailed last week on an extended tour of the Mediterranean and Southern Europe. They will be absent several months.

W. H. Craft, representing Alex. Cowan & Sons, Edinburgh, Scotland, and Andrew Robson, representing Andrew Whyte and Sons, Limited, and the Allandale Paper Co., Edinburgh, Scotland, are among the travellers for Old Country paper houses, who are now calling on the trade in all the principal Canadian cities on their annual visit.

Barber, Ellis, Davis, Limited, is the name of a new company which has been recently organized in Calgary, and will carry on a general business in paper and printers' supplies. This concern is separate entirely from the Barber, Ellis Co. of Toronto, and the President is F. M. Ellis, of Brantford, and the managing director,

The Northern Ontario Pulp and Development Co., Limited, have been granted a charter with a share capital of $150,000, and head offices in Toronto. The company is empowered to carry on the business of pulp and paper manufacturers, lumbermen, timbermen, saw millers, and to buy, sell and deal in timber and timber limits, etc. The incorporators are: Harold E. Manning, Bert H. L. Symmes, Robert H. Green, Percy W. Beatty, and Walter L. Lockhart Gordon, all of Toronto.

Gummed Paper, Limited, of Brampton, which has an output of three tons per day of gummed stickers and tape, and is the first industry of its kind in Canada, has begun operations under the management of E. R .Colbert.

John R. Barber, of Georgetown, the veteran paper manufacturer, was in Toronto last week for the first time in many months. He is looking well after his recent poor health.

NEWS PRINT EXPORT.

The export of newsprint paper, which, after rising rapidly up to June of last year, showed a tendency during the summer to slacken off a trifle, resumed its upward movement towards the close of 1913 and Novem figures show a total exportation which for the first time exceeds one million dollars for the month. The actual total, $1,037,207, compares with $631,227 for the same month a year previous, showing an increase of well over 50 per cent.

The export of chemical pulp in that month was also a record-breaker, and was about 70 per cent in excess of the amount exported in November, 1912; while mechanical pulp reached a record in October, but fell off in November to an amount little in excess of November, 1912, and inferior to several of the intervening months.

The following table shows the exportation of newsprint paper to the United States and to all countries (including the United tSates) for the respective months of the fiscal year to date, and also the exportation of chemical pulp and of mechanical pulp for the same period.

Paper Exports.

	U.S.	Total.
April	$ 462,909	$ 596,554
May	611,369	810,575
June	728,462	874,284
July	688,467	793,898
August	740,384	889,645
September	778,765	941,986
October	864,020	976,028
November	973,975	1,037,207
8 months, 1913	$5,848,351	$6,918,177
Nov., 1912	426,404	631,227
8 months, 1912	2,195,630	3,110,458

Pulp Exports.

	Chemical.	Mechanical.
April	$ 202,110	$ 143,126
May	201,276	234,494
June	121,199	173,445
July	218,302	251,284
August	203,542	267,171
September	232,835	399,057
October	233,159	467,878
November	273,278	357,688
8 months, 1913	$1,685,701	$2,292,143
November, 1912	178,032	331,625
8 months, 1912	1,300,389	2,430,459

The Markets

CANADIAN MARKETS.

Market conditions remain about the same as they have been for some time past. News print mills are busy and prices are well maintained. The number of inquiries for news print from the other side of the line is very satisfactory. Book and writing plants as well as coated paper plants are not rushed with business, but report that orders are picking up somewhat with the advent of spring, and things are taking on a more promising air. The printing trade is rather quiet at present, but more encouraging results are looked for. Wrapping paper and kindred lines are quiet, and there is still considerable price cutting going on, even in small quantities. The number of inquiries for ground wood pulp is large, but sales are not numerous. The sulphite situation is keeping up well, stocks are low, and prices are firm. Mixed papers are dull and in fact in all the cheaper grades of paper stock there is little moving at the present time. Roofing stock is assuming a better tone.

Prevailing quotations are:—

Paper.

News (rolls $1.95 to $2.00 at mill in car load lots.
News (sheet) $2.15 to $2.30, at mill in car load lots.
News (sheet) $2.35 to $2.75 at mill in less than car load lots.
Book papers (carload) No. 3, 3.75c to 4.50c.
Book papers (ton lots) No. 3, 4c to 4.50c.
Book paper (Carload) No. 2, 4.25c.
Book paper (ton lots) No. 2, 4.50c to 5c.
Book papers (carload) No. 1, 4.75c to 5.25c.
Book papers (ton lots) No. 1, 5.25c to 7.00c.
Writings, 5c to 7½c.
Sulphite Bond, 6½c to 7½c.
Grey Browns, $2.00 to $2.50.
Fibre, $2.75 to $3.50.
Manilla B., $2.40 to $3.75.
Manilla No. 2, $3.00 to $3.50.
Manilla No. 1, $3.00 to $3.75.
Unglazed Kraft, $3.50 to $4.50.
Glazed Kraft, $3.75 to $5.00.

Pulp.

Ground wood (at mill), $15 to $16.
Ground wood, $22 to $24, delivered in United States.
Sulphite (unbleached), $42 to $43, delivered in Canada.
Sulphite (unbleached), $42 to $44, delivered in United States.
Sulphite (bleached), $56 to $57, delivered in Canada.
Sulphite (bleached), $57 to $58, delivered in United States.

Paper Stock.

No. 1 hard shavings, $1.87½ to $1.90.
No. 1 soft white shavings, $1.75 to $1.80.
No. 1 mixed shavings, 50c.
White blanks, 90c.
Ordinary ledger stock, $1.15 to $1.20.
Heavy ledger stock, $1.40 to $1.50.
No. 1 book stock, 70c.
No. 2 book stock, 45c to 50c.
No. 1 Manilla envelope cuttings, $1.10 to $1.15.
No. 1 print Manillas, 60c.
Folded news, 45c to 50c.
Over issues, 50c to 52½c.
No. 1 clean mixed paper, 30c.
Old white cotton, $2.50 to $2.75.
Thirds and blues, $1.30 to $1.32½.
No. 1 white shirt cuttings, $5.00 ta $5.25.
Blue overall cuttings, $3.50 to $3.60.
Black overall cuttings, $1.75.
Black linings, $1.75.
New light flannelettes, $4.50.
Ordinary satinets, 70c to 75c.
Flock, 85c.
Tailor rags, 65c.

NEW YORK MARKETS.

Office Pulp & Paper Magazine,
209 Broadway, New York.

Paper mills are now fairly active, and are taking their normal supplies of chemical pulp. A few new contracts have been made both in bleached and unbleached sulphite, and the feeling in this market is that paper mills are now about caught up with their old contracts. Advices from abroad show a slight upward tendency in unbleached sulphite, which is likely to have some influence on the market here when the time arrives for making contracts. Numerous importations have been made in rather large quantities, and there is no excess supply at local docks. There has been a considerable inquiry for spot lots, some of which have not yet been filled on account of delays in the arrival of ships carrying the consignment for such orders. A scarcity of sulphate and Kraft pulp on this side has been reported in the interval. Importers having spot orders on hand have been unable to fill them, as there was no surplus on which to draw. It is difficult to obtain such pulp from Scandinavia, as navigation is now closed. In some cases spot orders have been filled in sulphite at a loss in order to eliminate the high costs of storage.

An increasing volume of business in mechanically ground wood pulp has been going on in the local market at prevailing prices. Manufacturers are confident that a better demand for their product is not far off, and that the current year will be a good one in ground wood. Spot lots are commanding fair prices, selling at $22.50 to $24.00 a ton.

Domestic rag stock has been in a little better inquiry than for more than two months. Paper mills have had sufficient orders on hand to use a good portion of the excess accumulation in this stock at the first of this year. Prices are still very low, but an increase will follow any active demand. The feeling is that prices are now at rock bottom and the future holds bright hopes among dealers. Importers have been taking advantage of the falling off in prices of foreign rags abroad, and many large importations have been made in the interval, although there were only a few spot orders on hand. Importers are willing to sell at buyers' prices at present, but are confident that a slightly better demand than at present, a rise in price will follow. As in domestic rags, paper mills are using their excess eccumulations, and will soon be in the market for more stock. Prices are as low now as they will ever go.

The demand for book paper stock has been the cause of a good deal of activity in the better grades of old waste papers, particularly hard and soft white shavings. Very recently, however, there has been a falling off in the demand for this grade. Some dealers reported that their shipments had fallen from 100 to 35 tons a week. A growing demand for boxboards has caused a brisk movement in the lower grades, and prices are moving upward. Strictly over-issue news has been in fair demand and prices are firmly maintained at 65c to 70c. No. 1 mixed papers have advanced from 30c to 35c, to 37½c to 42½c, and the feeling is that they will continue upward.

Pulp.

Ground Wood, No. 1, 20c to 24c, delivered.
Ground Wood, No. 2, 17c to 19c, delivered.
Unbleached sulphite, domestic, 1.90c to 2.20c per pound, delivered.
Unbleached sulphite, imported, 1.75c to 2c per pound, ex-dock, New York.
Bleached sulphite, domestic, 2.80c to 3c per pound, delivered.
Bleached sulphite, imported, 2.60c to 3.05c per pound, ex-dock, New York.
Easy Bleaching sulphite, imported, 2.05c to 2.20c per pound, ex-dock, New York.
Unbleached sulphate, imported, 1.75c to 2.10c per pound, ex-dock, New York.
Bleached sulphate, imported, 2.60c to 2.80c per pound, ex-dock, New York.
Kraft pulp, imported, 1.80c to 2.00c per pound, ex-dock, New York.
Soda pulp, domestc, 2.10c to 2.25c per pound, delivered.

Paper.

Business in paper has been gradually improving with the general tendency of business in the whole country. Snowstorms have caused tie-ups in shipments and mails containing orders which probably accounts for a slight easing in the local market. Along with this were the convention of jobbers and manufacturers in this city, and there was a general tendency to put off business until after these gatherings.

Prices have been firm, and in some cases show rather hardening tendencies. Paper bags have been going along in a fair way under the new lists, which were put into effect the first of the year. A fair demand for all grades of news has prevailed and all contracts are now made for the current year. Transient business in news has been fair, and manufacturers are hopeful of a still better demand. Boards, writings and ledgers have enjoyed some inquiry, especially among the higher grades. Book papers are still somewhat behind in delivery, and continued activity holds little hope for catching up in the immediate future.

Increased products of Kraft have created a better demand and the trade is confident of a bright year. Tissues have been in fair demand at prevailing prices, but the firmness of current values has been somewhat disturbed by a cut which was made several days ago, when certain mills of the middle west came into the market with offers of white tissue in car lots at 40c a pound, while the market quotation has been 42½c to 45c a pound on 1,000-ream and car lots. The demand for wrappings has been a little easier, but prices are firmly maintained. Boards are improving, and values have an upward tendency. A number of manufacturers have advanced the price of strawboard to $31 to $33 per ton. Toilet papers have been rather quiet, as dealers and jobbers were anxious to dispose of their old stocks before the first of this month, when the Brooks content and container law became effective, and sold out at the best prices possible. Having no demand on hand at present, they have placed only a few small orders with mills. Cigarette papers are in good inquiry and prices are firm.

News, rolls, transient business, $1.95 to $2.05 f.o.b. mill.
News, rolls, contract renewals, $1.95 to $2.00, f.o.b. mill.
News, sheet, $2.25 to $2.30 f.o.b. mill.
Book papers, car lots, C. & S. C., $4.00 to $4.50 f.o.b. mill.
Book papers, car lots, M.F.S., $3.75 to $3.90, f.o.b. mill.
Writing paper superfine, 13½c to 17c, del. east of Miss. River.
Writing paper, extra fine, 11c, del. east of the Miss. River.
Writing paper, No. 1, fine, 9c., del. east of the Miss. River.
Writing paper, No. 2, fine, 8c, del. east of the Miss. River.
Writing paper, engine sized, 4½c to 8c, del. east of the Miss River.
Bond paper, 5c to 24c, delivered east of Mississippi River.
Ledger paper, 8c to 30c, delivered east of Mississippi River.
Linen paper, 7c to 1c8, delivered east of Mississippi River.
Manila jute, 4¾c to 5¼c, delivered.
Manila, wood, $2.40 to $3.00, delivered.
Kraft, No. 1, $3.50 to $3.75, f.o.b., mill.
Kraft, No. 2, $3.25 to $3.50, f.o.b., mill.
Boxboards, news, $30 to $33 per ton, delivered.
Boxboards, chip, $28 to $31 per ton, delivered.
Boxboards, straw, $28 to $31 per ton, delivered.
Wood pulp board, $42.50 to $45 per ton, delivered.
Tissue, white, cylinder, 42½c to 45c, delivered.
Tissue, fourdrinrie, 47½c to 52½c, delivered.
Tissue, jute Manila, 42½c to 45c, delivered.

THE BRITISH MARKETS.

(Special to Pulp & Paper Magazine.)

London, Feb. 18, 1914.

The scarcity of new business during the close of 1913 has prevailed in the British paper industry right into the opening months of the present year. There is no hiding the fact that things are not at all satisfactory now from the mill owners point of view, and added to the dullness in business there is the great difficulty of extracting an extra charge on any class of papers to recoup the extra outlay imposed by the heavy cost of production and excessive trans port charges. Agents as well as mill men are grumbling at the small demand for all papers and the export trade shows very little improvement. During January, British writing paper, printing paper, pasteboards, playing cards, envelopes, bags, etc., were exported to the extent of £332,538 (16,820 tons) as against £334,844 (16,147 tons) in January 1913. Newsprint and hangings fell off very considerably, whilst writing papers only advanced in the export returns to the extent of £5,000 compared with January 1913, and a decrease of £2,000 when compared with the same month in 1912. The figures for the Dominion and U.S.A. are as follows:—To Canada: Writing paper 475 cwts., as against 459 cwts. in January 1913; newsprint and other printings, 6,853 cwts., a decline of 6,297 cwts.; unenumerated papers 336 cwts., compared with 178 cwts. To U.S.A.: Writing paper, 201 cwts., a decline of 25 cwts.; printing papers and newsprint, 3,780 cwts., as against 2,789 cwts.; unenumerated papers, 213 cwts., a decline of 87 cwts. compared with January 1913. These figures show that trade with Canada and the States has not been prosperous in January. Turning to the imports, Newfoundland has made a wonderful jump in the export trade to England. In January 1913 the mills in Newfoundland sent to England 17,140 cwts. of printing and writing paper on reels, whilst in January last the figures rose to 104,535 cwts. These imports beat all countries sending to the British market, and naturally the effect is keenly felt. The total imports from all places into England and Scotland, etc., reached 495,63 tons, valued at £631,043 compared with 49,514 tons valued at £611,699 in January 1913.

* * * *

The dullness prevailing in the paper industry has caused a very limited demand for sulphite and sulphate. British mill men are not disposed to much business and from Scandinavia comes the report that if it was not for America, Norway and Sweden, mills would feel the turn of events very keenly. Quotations are now about as follows:—

Sulphite bleached (No. 1)	$57.60	to	$60.00
Sulphite Easy Bleaching (No. 1)	42.00	to	43.20
Sulphite news	38.40	to	39.40
Soda unbleached (No. 1)	38.45	to	40.80
Soda Kraft	38.00	to	38.60

All quotations c.i.f. British ports. During January chemical pulps were imported to the extent of 35,511 tons, compared with 33,262 tons in 1913. No supplies arrived from Canada. Sweden and Norway were the largest supplying countries.

* * * *

The mechanical pulp market still keeps featureless, and very little business is passing. Hopes, however, are entertained that within a brief period the market will be changed, and sellers are looking forward to an improved demand. Prices are now firm, with a tendency to harden for prompt delivery. Quotations:—

Pine 50 per cent moist (unwrapped)	$10.30	to	$10.75
Pine dry	20.40	to	30.20

For forward delivery add about half a dollar. All prices c.i.f. British ports. In January 40,000 tons of mechanical wet and dry pulp were imported into the British market, as compared with 42,906 tons in January, 1913. The countries supplying mechanical wet were: Sweden, 6,729 (compared with 713,218 in January 1913); Norway 29,807 tons (27,578 tons in January 1913); Canada 1,294 tons (307 tons in January 1913); other countries, 818 tons (compared with 1,027 tons).

* * * *

The esparto trade is receiving a severe check owing to the extremely high prices that prevail at present. There is no active demand, and sellers are reserved and unwilling to offer freely. African prices are again advancing and are very firm.

* * * *

The chemical and paper stock trades are fairly active, and values are unchanged since last report in the Pulp and Paper Magazine. China clay and other mineral fillings are dearer, and the supply is not equal to the demand.

SWEDISH MARKETS.

English buyers of Mechanical Wood Pulp are still holding back, unless they can get on at a very low price, and we learn to our surprise that some sales amounting to about 3,000 tons were made last and this week on a basis of only Kr. 33, including commission, for prompt shipment. The mills have probably wished to clear out their stocks to be prepared if the lockout had become effective. Continental buyers, on the other hand, are slowly increasing their bids. Sellers seem generally to be of the opinion that the market for future delivery will probably harden and they are therefore not inclined to entertain low bids for contracts over the year.

America has purchased this fortnight many thousands of tons of Sulphite cellulose, mostly Strong, from the North of Sweden, but also some Easy Bleaching from Norway; the prices which have been obtained have been very satisfactory for sellers.

A contract for a couple of thousand tons of Strong Sulphate, also to America for delivery over the year, has likewise been made and full price has been paid. Owing to a scarcity of Esparto there is more inquiry for Sulphate pulp.

INTERNATIONAL PAPER.

Phillip T. Dodge, president of the International Paper Co. believes that the future of the concern lies largely in the development of its Canadian properties.

In a report to shareholders having regard to 1913 conditions, Mr. Dodge says:—

"Net results were affected injuriously for a time, by the agitation and uncertainty due to the placing of news paper on the free list, the consequent fear that there would be a great influx of cheap foreign news paper, and the temporary reduction of prices by timid U.S. manufacturers to a point approaching the cost to manufacture.

"It was soon realized, however, that steadily increasing consumption of paper would, at an early day, demand the normal production of all existing mills in the U.S. and Canada, and justify the reasonable prices prevailing for the past twow years. That the future growth of your company must be largely in the development of its Canadian properties is more a cause for concern to labor and the public generally than to you.

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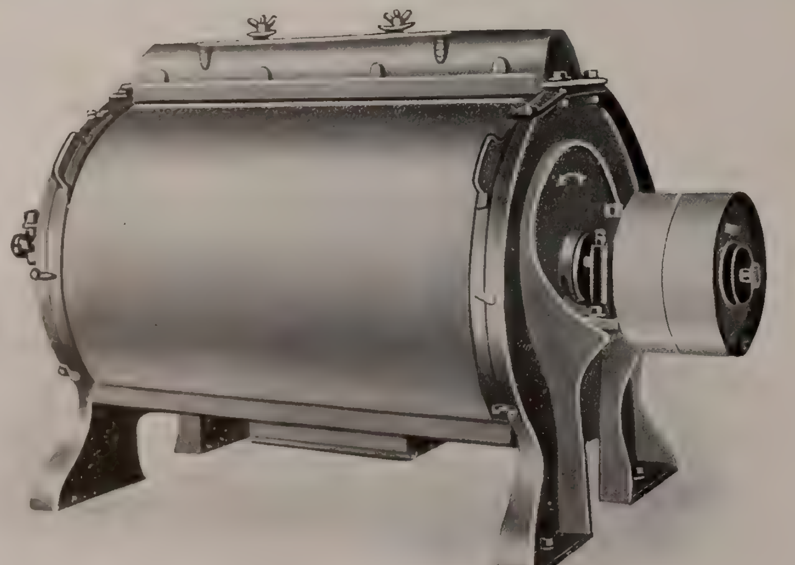

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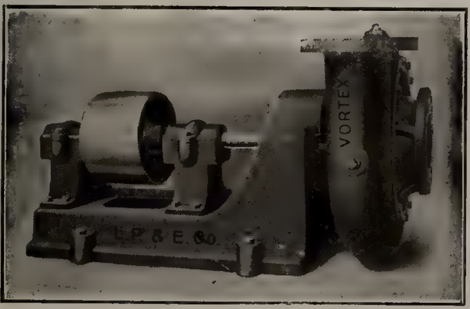

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SALE BY AUCTION

To be sold at public auction by an Order of the Supreme Court of British Columbia, made in an action re Ocean Falls Co., Limited, Western Canada Trust Limited v. Allen et .al. W. 2250-13, by Mr. John S. Rankin, at the Board of Trade Rooms, 543 Hastings Street West, in the City of Vancouver, on Monday, the 23rd day of March, 1914, at 11 o'clock in the forenoon, as a going concern, the undertaking and property of the Ocean Falls Co., Limited, situate in the Province of British Columbia.

The property consists of:—

1.—The freehold lands known as District Lot 31, Range 3, Coast District containing about 260 acres together with Water License appurtenant thereto out of the Link River flowing to Cousin's Inlet for use on said Lot 31.

2.—District Lot 103, Range 3, Coast District, containing about 142 acres.

3.—Pulp Lease No. 1 granted by the Government of British Columbia, dated 9th of January, 1907, comprising 20,190 acres for 21 years at $406.54 a year.

4.—Pulp Lease No. 2 granted by the Government of British Columbia, dated the 9th of January, 1907, comprising 59,672 acres, for 21 years at $1,193.44 a year.

5.—Sawmill of improved type. Capacity 350,000 feet B. M. per day.

6.—Pulp Mill, capacity 150 dry tons mechanical ground wood pulp per day.

7.—Power Plant and Hydro-Electric Development of 11,000 H. P.

8.—Logging Camp and Marine Equipment consisting of camps, roads, donkey engines, rigging tugs, scows, launches, etc.

9.—Townsite. comprising hotel, general store, hospital, school, wireless station, dwellings, cottages, bunkhouses, wharves, warehouses, etc.

10.—Office Furniture, fixtures and fittings of the said Company at Ocan Falls and at Winch Building, Vancouver.

If the property is not sold by auction it will be offered for sale by tender by Archie B Martin, the Receiver for the Debenture Holders.. Tenders are to be sent in a sealed cover endorsed "Tender for purchase of Ocean Falls Property," and addressed to the said Archie B. Martin, at 321 Winch Building, Vancouver, B. C., and must be delivered not later than 12 o'clock on Saturday, the 28th day of March, 1914.

Particulars and conditions of sale and forms of tender may be obtained from:

JOHN S. RANKIN, Vancouver, B. C.

ARCHIE B. MARTIN,
The Receiver for Debenture Holders,
Winch Building, Vancouver, B. C.

JOHN F. HELLIWELL,
Attorney for Western Canada Trust Limited,
Trustee for Debenture Holders,
714 Yorkshire Bldg., Vancouver, B. C.

TUPPER KITTO & WIGHTMAN,
Solicitors for the Receiver and the Trustee
and First Debenture Holders,
Royal Bank Chambers, Vancouver, B. C.

DAVIS, MARSHALL, MACNEILL & PUGH,
Solicitors for the Company and the
Second Debenture Holders,
London Building, Vancouver, B. C.

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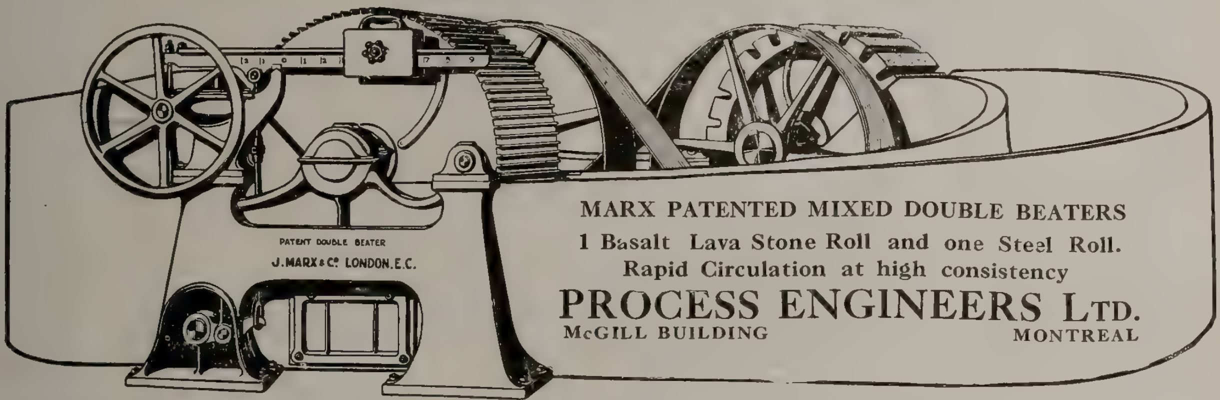

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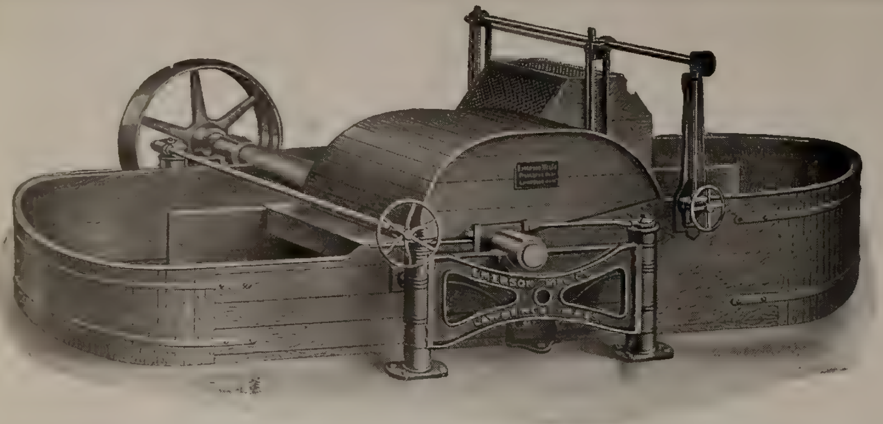
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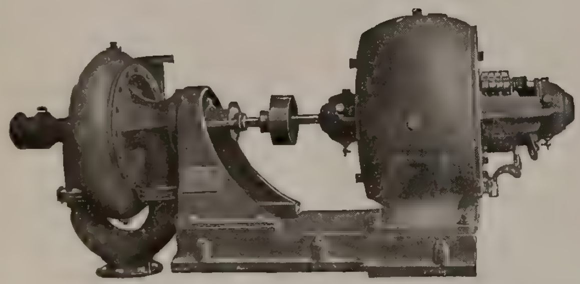

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INDEX TO MILL SUPPLIES

This Directory is published to facilitate the work of our readers, in the mills. If the information sought is not found, an invitation is extended to communicate with the editor, who will gladly be of all assistance possible.

Air Hoists
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Bags.
Smart-Woods Ltd , Montreal, Que.

Barkers
Boving & Co. of Canada, Limited.
Carthage Machine Co., Carthage, N.Y.
Canadian Barker Co., Ltd., Sault Ste. Marie, Can.
Green Bay Barker Co., Green Bay, Wis.
Hamilton, Wm., Co., Peterboro, Can.
Waterous Engine Works Co. Ltd., Brantford, Can.
Valley Iron Works, Appleton, Wis.
Voith, J. M. Co., Inc., New York, N.Y.

Beaters
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Mach. Co., Lawrence, Mass.
Emerson Mfg. Co., Lawrence, Mass.
Jones, E. D. & Sons Co., Pittsfield, Mass.
Marx & Co., J., London, England.
Process Engineers, Ltd., Montreal, Canada.
Voith, J. M. Co., Inc., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford, Can.
Tippet Arthur P. & Co., Montreal. Can.

Belting
Can. Fairbanks-Morse Co., Ltd., Montreal, Canada
Capital Wire Cloth and Manufacturing Co. Ltd., Ottawa, Ont.
Dominion Belting Co., Hamilton, Can.
Federal Engineering Co., Ltd., Montreal, Que.
Federal Engineering Co., Toronto, Ont.
Manhattan Rubber Mfg. Co., Passaic, N.J.
Reddaway, F. & Co., Montreal, Can.

Bleaching Powders
Brunner, Mond & Co., Montreal, Can.
Hooker Electrochemical Co., Wall St., New York, N.Y.
Klipstein, A. & Co., Ltd., Montreal, Can.
Winn & Holland, Montreal, Can.

Bleaching Machinery
Boving & Co., of Canada, Limited, Toronto, Ont.

Blowers
Sherbrooke Mach. Co , Sherbrooke Que.

Boilers
Canadian Allis-Chalmers, Ltd., Toronto
MacDougall, J., Caledonian Iron Works, Montreal, Can.
Waterous Engine Works Co. Ltd., Brantford, Can

Brass Wire Cloth, Fourdrinier Wires
Capital Wire Cloth and Mfg., Co., Ltd., Ottawa, Ont.
Christie, Geo., Ltd., Glasgow, Scotland.
Johnson, C. H. & Sons, St. Henry, Montreal, Can.
Taylor, James, St. Francois Xavier Street, Montreal, Can.
Tippet, A. P. & Co., Montreal, Can.
United Wire Works, Edinburgh, Scotland.
Westbye, P. P., Peterboro, Can.

Calender Rolls
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Machine Co., Lawrence, Mass.
Farrell Foundry & Mach. Co., Ansonia, Conn.

Camel Hair Belting
Reddaway, F. & Co., Montreal, Can.

Carriers
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Case Slings
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Causticising Systems
Boving & Co., of Canada, Limited, Toronto, Ont.

Chemicals, Colors, Etc.
Brunner, Mond & Co., Montreal, Can.
Gewerkschaft Sachtleben, Homberg, Niederrheim, Germany.
Klipstein, A. & Co., Montreal, Can.
Hooker Electrochemical Co., New York, N.Y.
Paper Makers' Chemical Co., Easton, Pa.
Tippet A. P. & Co., Montreal, Can. .
Wilson-Paterson Co., Board of Trade Bldg., Montreal, Can.
Winn & Holland, Montreal, Can.

Chain Crane
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Chain Blocks
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Chain Clutches
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Chain Slings
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

China Clay
China Clay Co., Manchester, England.
Klipstein, A. & Co., St. Peter Street, Montreal, Can.
Paper Makers' Chemical Co., Easton, Pa.
Wilson-Paterson Co., Board of Trade Bldg., Montreal, Can

Chippers
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Valley Iron Works, Appleton, Wis.

Chip Screens
Boving & Co., of Canada, Limited, Toronto, Ont
Carthage Machine Co., Carthage, N.Y.

Cranes
Boving & Co. of Canada, Limited, Toronto, Ont
Hamilton, Wm. Co., Ltd., Peterboro, Can.
Northern Crane Works, Ltd., Walkerville, Ont.
Smart-Turner Mach. Co., Hamilton, Ont

Coal Handling Machinery
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Cranes—Gantry
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Cranes—Hand Power
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Cranes—Overhead Travelling
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Cranes—Post Jil
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Cranes—Wall
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Conveying Machinery
Caldwell, H. W. & Son Co., Chicago, Ill
Jeffrey Mfg Co., Montreal, Can.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Couch Rolls
Bertrams Ltd., Edinburgh, Scotland.
Chambers Ltd., 152 Bay Street, Toronto.
Sherbrooke Mach Co Ltd., Sherbrooke, Q

Cylinders
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co. of Canada, Limited, Toronto, Ont
Chambers Ltd., 152 Bay Street, Toronto.
Sherbrooke Machinery Co., Sherbrooke, Que.

Cutters
Bertrams Ltd., Edidburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Machine Co., Lawrence, Mass.

Cylinder Covers
Boving & Co , of Canada, Limited, Toronto, Ont.
Johnson, C. H. & Sons, Ltd., St Henry, Montreal, Que.
Kufferath, Andreas, Mariaweiler, Germany.

Cylinder Moulds
Bertrams Ltd., Edinburgh, Scotland.
Chambers Ltd., 152, Bay Street, Toronto.
Sherbrooke Machinery Co., Sherbrooke, Que,

Cylinder Rolls
Capital Wire Cloth and Manufacturing Co. Ltd., Ottawa, Ont.

Dandy Rolls
Capital Wire Cloth and Manufacturing Co. Ltd., Ottawa, Ont
Chambers Ltd., 152 Bay Street, Toronto.
Johnson & Sons, C. H., St. Henry, Montreal, Can.
Marshall, T J. & Co., Ltd., London, Eng.

Digester Lining
Boving & Co., of Canada, Limited, Toronto, Ont.
Panzl Digester Lining Co., Muskegon, Mich.
Preston's Digester Lining Co., Radcliffe, Eng.
Stebbins Eng. & Mfg. Co., Watertown, N.Y.

Digesters
Boving & Co., of Canada, Limited, Toronto, Ont.

Digester Gauges
Schaeffer & Budenberg, Brooklyn, N.Y.

Drainer Bottoms
Snell, Samuel, Co., Holyoke, Mass

Dryers
Bertram Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.

Electric Cranes
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Elevating and Conveying Machinery
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Evaporators
Boving & Co., of Canada, Limited, Toronto, Ont.
Process Engineers, Ltd., Montreal, Canada.
Scott, Ernest & Co., Fall River, Mass.

Exhausters
The Sherbrooke Machinery Co., Sherbrooke, Que.

Experimental Machinery
Chambers Ltd., 152 Bay Street, Toronto.
Marshall, T. J. & Co , Ltd., London, Eng.
Process Enginners Ltd., Montreal, Can.

Exporters
Parsons Trading Co., New Tork, N.Y.

Felts
Ayers, Ltd., Lachute Mills, Que.
Bates & Innes, Ltd., Carleton Place, Ont.
Bredt, F. & Co., New York, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Dallyn, Jardine & Co., Toronto, Can.
Heimbach, Thos. Jos., Ltd., Duren, Germany.
Huyck, F. C., Albany, N.Y.
Johnson, C. H. & Sons, St. Henry, Montreal, Can.
Penmans, Ltd., St. Hyacinthe, Can.
Porritt, Joseph & Sons, Manchester, Eng.
Spencer, J. H. & Sons, Bury, England. .
Tippett Arthur P & Co., Montreal, Can

Filters
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Norwood Engineering Co. of Canada, Ltd., Cowansville, P.Q.

Fourdriniers Wires
(See Brass Wire Cloth.)

Friction Hoists
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Gauges
Schaeffer & Budenberg, Brooklyn, N.Y

Generators and Transformers
Chambers Ltd., 152 Bay Street, Toronto.
Siemens Co., of Canada, Ltd., Montreal, Can.

Gravity Lowering Blocks
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Grinders
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Glens Falls Mach. Works, Glens Falls, N.Y.
Hamilton, Wm., Co., Peterboro, Can.
Voith, J. M. Co., Inc., New York, N.Y.
Voith, J. M., Wurtemberg, Germany.
Waterous Engine Works Co. Ltd., Bran

MILL SUPPLIES---Continued

Heating
Sheldons, Ltd., Galt, Ont.

Hand Hoists
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Hoists.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Northern Crane Works Limited, Walkerville, Ont

Hoists—Chain Electric and Pneumatic
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Jordan Engines
Boving & Co., of Canada, Limited, Toronto, Ont.
Jones, E. D. & Co., Pittsfield, Mass.
Process Engineers, Ltd., Montreal, Canada.

Knives
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Crookes, Roberts & Co., Sheffield, Eng.
Hay, Peter, Knife Co., Galt, Can.
Tippet, A. P. & Co., Montreal, Can.

Kollergangs
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont
Chambers Ltd., 152 Bay Street, Toronto.

Laying Machines
Chambers, Ltd., Toronto.
Collis & Sons, J., London, Eng.

Motor
Chambers Ltd., 152 Bay Street, Toronto.
Siemens Co. of Canada, Ltd., Montreal, Can.

Packings
Canadian Consolidated Rubber Co., Montreal, Can.

Presses
Boving & Co., of Canada, Limited, Toronto, Ont.
Can. Boomer & Boschert Press Co., Montreal, Can.
Chambers Ltd., 152 Bay Street, Toronto.

Paper Stock, Etc.
Hough, R., London, England.
Pullan, E., 490 Adelaide Street, W., Toronto, Can.
Walker, J. R., & Co., 35 Common Street, Montreal, Can.

Paper and Pulp Machinery
Beloit Iron Works, Beloit, Wis.
Bentley & Jackson, Bury, England.
Bertram, James & Son, Ltd., Edinburgh, Scotland.
Bertram's, Ltd., Edinburgh, Scotland.
Black-Clawson Co., Hamilton, Ohio.
Canadian Boomer & Boschert Press Co., Ltd., Montreal.
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Chambers Ltd., 152 Bay Street, Toronto, Can.
Dillon Machine Co., Lawrence, Mass.
Emerson Mfg. Co., Lawrence, Mass.
Farrell Foundry & Mach. Co., Ansonia, Conn.
Fullner, H., Warmbrunn, Germany.
Glens Falls Machine Works, Glens Falls, N.Y.
Green Bay Barker Co., Green Bay, Wis.
Hamilton, Wm., Co., Peterboro, Can.
Harmon Machine Co., Watertown, N.Y.
Jones, E. D. & Sons Co., Pittsfield, Mass.
Johnson, C. H. & Sons, Ltd., Montreal, Can.
Marx, J. & Co. London, E.C., England.
Moore & White Co., Philadelphia, Pa.
Process Engineers, Ltd., Montreal, Canada.
Rice, Barton & Fales .Worcester, Mass.
Sandy Hill Iron & Brass Works, Hudson Falls, N.Y
Scott, Ernest & Co., Fall River, Mass.
Sheldons, Ltd., Galt, Can.
Sherbrooke Mach. Co., Ltd., Sherbrooke, Can.
Smith, S. Morgan, Co., York, Pa.
Stebbins Eng. & Mfg. Co., Watertown, N.Y.
Ticonderoga Machine Works, Ticonderoga, N.Y.
Valley Iron Works, Appleton, Wis.
Voith, J. M., New York, N.Y.
Voith, J. M., Wurtemberg, Germany.
Walmsley, Chas. & Co., Bury, Eng.
Waterous Engine Works Co., Ltd., Brantford, Can.
Westbye, P. P., Peterboro, Can.

Paper Machine Tachomoters
Boving & Co., of Canada, Limited, Toronto, Ont.
Schaeffer & Budenberg, Brooklyn, N.Y.

Paper Tester
Chambers Ltd., 152 Bay Street, Toronto.
Marshall. T. J. & Co., Stoke Newington, London. England.

Pneumatic Thickeners
Sherbrooke Mach. Co., Ltd , Sherbrooke, Que.

Pneumatic Chain Blocks
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Press Rolls
Bertrams Ltd., Edinburgh, Scotland.
Chambers Ltd., 152 Bay Street, Toronto.
Sherbroke Mach. Co Ltd., Sherbroke, Que.

Press Wire Cloth.
Chambers Ltd., 152 Bay Street, Toronto.
Kufferath, Andreas, Mariaweiler, Germany.

Pulp Stones
Stancliffe Estates Co., Ltd., Darley Dale, England.

Pumps
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Machine Co., Lawrence, Mass.
Glen Falls Machine Works, Glens Falls, N.Y.
Hamilton, Wm., Co., Peterboro, Can.
Lawrence Machine Co., Lawrence, Mass.
Lawrence Pump & Engine Co., Lawrence. Mass.
Smart-Turner Machine Co., Hamilton, Can.
Sherbrooke Mach. Co., Ltd , Sherbrooke, Que.
Voith, J. M., New York, N.Y.

Rags
Walker, J R. & Co., Montreal, Can.

Recording Gauges
Schaeffer & Budenberg, Brooklyn, N.Y.

Recording Thermometers
Schaeffer & Budenberg, Brooklyn, N.Y

Refiners
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Marx, J. & Co., London, E.C., England.
Process Engineers, Ltd., Montreal, Canada.
Rice, Barton & Falls Mach. & Iron Co., Worcester, Mass.
Voith, J. M., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford, Can.

Rope Blocks
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Rosin Size
Fox, Stockell & Co., London, Eng.
Paper Makers Chemical Co., Easton, Pa.
Process Engineers, Ltd., Montreal, Canada.
Vera Chemical Co., North Milwaukee, Wis.
Wilson-Paterson Co., Board of Trade Bldg., Montreal, Can.

Rosin Size Boilers and Dissolvers
Boving & Co., of Canada, Limited, Toronto, Ont.

Rotary Sulphur Furnaces
Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Pulp Mill Machinery Co., Montreal, Can.
Stebbins Engineering and Manufacturing Co., Watertown, N Y

Runways—Hand operated
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Save-Alls
Boving & Co., of Canada, Limited, Toronto, Ont.
Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
Waterous Engine Works Co., Ltd., Brantford, Can.

Self Landing, Self Delivery Hoists
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Screen Plates
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.

Screens
Bertrams Ltd , Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street. Toronto.
Glens Falls Mach. Wks., Glens Falls, N Y
Harmon Machine Co., Watertown, N.Y
Johnson, Chas., St. Henry, Que.
Marx & Co., J., London, England.
Process Engineers, Ltd., Montreal, Canada.
Sherbrooke Mach. Co. Ltd. Sherbrooke, Que
Tippet Arthur P. & Co., Montreal, Cau.
Voith, J. M., New York, N.Y.
Voith, J. M., Wurtemberg, Germany.
Waterous Engine Works Co. Ltd., Brantford, Can.
Westbye, P. P., Peterboro, Can.

Shear Legs
Morris, Herbert, Hoist & Crane Co., Toronto, Ont.

Slings
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Slitters and Re-Winders
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Cameron Machine Co., Brooklyn, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Moore & White Co., Philadelphia, Pa.
Ticonderoga Machine Works, Ticonderoga, N.Y.

Smelting Furnaces
Boving & Co., of Canada, Limited, Toronto, Ont.

Straw Cutters'
Bertrams Ltd., Edinburgh, Scotland
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.

Straw Dusters
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.

Straw Digesters
Boving & Co., of Canada, Limited, Toronto, Ont.

Strawboard Making Machines
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.

Steam Regulator
Pickles, W. F., Buckland, Conn.

Stuff Chests
Boving & Co., of Canada, Limited, Toronto, Ont.

Sulphite Mill Equipment
Boving & Co., of Canada, Limited, Toronto, Ont.
Stebbins Engineeringand Manufacturing Co., Watertown, N.Y

Sulphate Mill Equipment
Boving & Co., of Canada, Limited, Toronto, Ont.

Sulphur
Union Sulphur Co., 17 Battery Place, New York, N.Y.

Sulphur Burners
Boving & Co., of Canada, Limited, Toronto, Ont.
Glens Falls Machine Works, Glens Falls, N.Y.
Stebbins Engineering and Manufacturing Co. Watertown, N.

Tachometers (Hand and Stationary)
Boving & Co., of Canada, Limited,Toronto, Ont.
Schaeffer & Budenberg, Brooklyn, N.Y.

Track Systems
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Tanks
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Boving & Co., of Canada, Limited, Toronto, Ont.
Hamilton, Wm., Co., Peterboro, Can.
McDougall, John, Caledonian Iron Works, Montreal, Can.

Thermometers
Schaeffer & Budenberg, Brooklyn, N.Y.

Transmission Machinery
Caldwell, H. W. & Son Co., Chicago, Ill.
Canadian Allis-Chalmers, Limited, Toronto
Boving & Co., of Canada, Limited, Toronto
Jones & Glassco, Montreal, Can.

Traveling Cranes
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Trolleys
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

MILL SUPPLIES---Continued

Turbines

Boving & Co., of Canada, Toronto, Ont.
Canadian Allis Chalmers, Ltd., Toronto, Ont.
Smith, S. Morgan Co., York, Pa.
Voith, J. M. Co., Inc. New York, N.Y.
Voith, J. M., Wurtemberg, Germany.

Water Wheels

Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Hamilton, Wm. Co., Ltd., Peterboro, Can.
Smith, S. Morgan Co., York, Pa.
Voith, J. M., New York, N.Y.

Wire Cloth for Paper Machines

Chambers, Ltd., Toronto.
Christie, Geo., Ltd., Glasgow, Scotland.
Johnson, C. H. & Sons, Ltd., St. Henry, Montreal, Que
Kufferath, Andreas, Mariaweiler, Germany.
Tippet, Arthur P. & Co., Montreal, Can.
Taylor, J. A., Montreal, Can.
United Wire Works, Ltd., Edinburgh, Scotland.
Westbye, P. P., Peterboro, Can.

Waste

Hough, R., London, England.

Wet Machines

Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Glens Falls Machine Works, Glens Falls, N.Y.
Hamilton, Wm. Co., Peterboro, Can.
Norwood Engineering Co. of Canada, Ltd., Cowansville, P.Q.
Process Engineers, Ltd., Montreal, Canada.
Sherbrooke Machinery Co., Sherbrooke, Can.
Voith, J. M., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford Ont.

PULP AND PAPER MILL PRODUCTS

This aims to be a complete list of the products of Canadian Pulp and Paper Mills, who are urged to send us lists of brands and watermarks, as well as the headings under which they wish to be indexed. Buyers who cannot meet their requirements from this list, are invited to communicate with the editor, who is in close touch with the mills, and will gladly furnish full information.

PULP MILLS

Ground Wood Pulp

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
Basin Electric Light & Power Co., Ltd., Montmagny, Que.
Beaver Co. Ltd., Thorold, Ont.
Belgo-Canadian Pulp & Paper Co., Shawinigan Falls, Que.
Brompton Pulp & Paper Co., Brompton and E. Angus, Que.
Booth, J. R. Ottawa, Ont.
Bronson Co., Ltd., Ottawa, Ont.
Clyde River Pulp & Paper Co., Ltd., Liverpool, N.S.
Colonial Wood Products Co., Ltd., Thorold. Ont.
Campbell Lumber Co., Weymouth, N.S.
Canada Paper Co., Ltd., Montreal, Que.
Chicoutimi Pulp Co., Chicoutimi, Que.
Compagnie de Pulpe de Dalmas, Dalmas, Que.
Davy, James, Thorold, Ont.
Eddy Co., The E. B., Ltd., Hull, Que.
East Canada Power & Pulp Co., Ltd., Nairn Falls, Que.
Foley-Rieger Pulp & Paper Co., Ltd., Thorold, Ont.
Ford, J. & Co., Port Neuf, Que.
Jacques-Cartier Pulp & Paper Co., Montreal.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
La Cie de Metabetchouan, St. Andre, Que.
La Havre Pulp Co., Ltd., Bridgewater, N.S.
Lake Megantic Pulp Co., Lake Megantic, Que.
Laurentide Co., Ltd., Grand Mere, Que.
MacLaren Co., Ltd., The James, Buckingham, Que.
McLeod Pulp Co., Ltd., Liverpool, N.S.
News Pulp & Paper Co., Ltd., St. Raymond, Que.
Nicolet Falls Pulp & Lumber Co., Nicolet Falls, Que.
North Shore Power, Railway & Navigation Co., Clarke City.
Northumberland Paper & Electric Co., Campbellford, Ont.
Nova Scotia Wood & Pulp Co., Ltd., Mill Village, N.S.
Ontario Paper Company, Thorold, Ont.
Ouiatchouan Falls Paper Co., Ouiatchouan Falls, Que.
Powell River Co., Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que'
Price-Porritt Pulp & Paper Co., Rimouski, Que.
Reed, A. E. & Co., (Nfld.), Ltd., Bishop's Falls, Nfld.
River-du-Loup Pulp Co., Ltd., Fraserville, Que.
Soucy, F. Florentine, Old Lake Road, Que.
Spanish River Pulp and Paper Mills, Ltd., Espanola, Ont., Sturgeon Falls, Ont., Toronto, Ont., and Sault Ste. Marie, Ont.
St. George Pulp and Paper Co., St. George, N.B.
Thorold Pulp Co., Ltd., Thorold, Ont.
Trent River Paper Co., Ltd., Frankford, Ont.
Union Bag & Paper Co., Cape Madeleine, Que.
Trent Valley Paper Mills, Glenmiller, Ont.
Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Q

Kraft

Brompton Pulp & Paper Co., East Angus, Que.
Dryden Timber and Power Co., Dryden, Ont.
New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
Quebec and St. Maurice Industrial Co., La Tuque, Que.
Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que

Soda Fibre

Canada Paper Co., Ltd., Montreal and Toronto.
Dominion Paper Co., Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.

Sulphite Fibre

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
Booth, J. R., Ottawa, Ont.
Dominion Pulp Co., Ltd., Chatham, N.B.
Edward Partington Pulp & Paper Co., Ltd., St. John, N.B.
Eddy Co., The E. B., Ltd., Hull, Que.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Lake Superior Paper Co., Ltd., Sault Ste. Marie, Ont.
Powell River Co., Ltd., Powell River, B.C.
Price Bros. & Co., Ltd, Kenogami, Que.
Riordan Pulp & Paper Co., Ltd., Montreal, Que.
Spanish River Pulp and Paper Mills Ltd., Sturgeon Falls, Ont., and Sault Ste. Marie, Ont.
Swanson Bay Forests, Wood, Pulp & Lumber Mills, Ltd., Swanson, Bay, B.C.
Toronto Paper Mfg. Co., Ltd., Cornwall, Ont.

PAPER MILLS

Bag

Eddy, The E. B. Co., Ltd., Hull, P. Q.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
Ford, J. & Co., Port Neuf.
Wilson, Ltd., J. C., 61 St. Alexander Street, Montreal, Que.
Jonquiere Pulp Co., Jonquiere, Que.

Binders' Board

McArthur, Alex. & Co., Montreal.
Northumberland Paper and Electric Co., Campbellford, Ont.

Blotting

Canada Paper Co., Montreal, Que., "Velvet Blotting."

Board

See Wood Board and Cardboard Specials.

Bond

Canada Paper Co., Ltd., Montreal, Que. "Burmese Bond," "St. Lawrence Bond," "Canada Bond," "Burmese Linen Ledger," "Windsor Mills Special," "Silverstream," "Springvale," "Super Writing," "White Railway," "Railway Manilla."
Howard Smith Paper Mills, Ltd., Montreal & Beauharnois, Que.
Kinleith Paper Co., Ltd., St. Catharines, Ont.
Rolland Paper Co., St. Jerome, Que., Mount Rolland, Que. and Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Book and Litho

Canada Paper Co., Ltd., Montreal, Que. "Art Photo Book," "Tinted Art Book," "Art Chromo," "English Book," "Satin Book," "Satin Litho," "Litho Label," "Super S. C. Book," "Standard S. C. Book," "Windsor Book."
Eddy Co., The E. B. ,Ltd., Hull, Que.
Kinleith Paper Co., Ltd., St. Catharines, Ont.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Box Board

See Wood Board and Cardboard Special .

Dominion Timber Regulations

Licenses to cut timber on Dominion Lands in the Provinces of Manitoba, Saskatchewan, and Alberta, the Northwest Territories, within twenty miles on either side of the main line of the Canadian Pacific Railway in the Province of British Columbia, and in the tract of three and one-half million acres to be located by the Government of the Dominion in the Peace River district in the Province of British Columbia, lying east of the Rocky Mountains and adjoining the Province of Alberta, shall be disposed of by public auction at the office of the Dominion Timber Agent for the district in which the berths are situated.

Before any parcel of timber is offered for sale it shall be surveyed by a duly qualified Dominion Land Surveyor into berths of an area not exceeding twenty-five square miles, and each of such berths shall then be thoroughly cruised by a duly qualified timber cruiser in the employ of the Dominion Government. The Minister shall then fix an upset price at which the berth shall be disposed of, and no berth shall be sold at less than the price so fixed.

Purchases to the amount of one thousand dollars or under shall be paid in cash at the time of sale. Purchases over one thousand dollars and not exceeding five thousand dollars shall be paid, one-half in cash at the time of sale, and a note or notes shall be given for the remaining half of the purchase price, payable in three months, with interest at the rate of five per cent. per annum. Purchases over five thousand dollars and not exceeding ten thousand dollars shall be paid one-third in cash at the time of sale, and notes shall be given for the remaining two-thirds of the purchase price, payable in three and six months, with interest at the rate of five per cent. per annum. Purchases exceeding ten thousand dollars shall be paid one-fourth in cash at the time of sale, and notes shall be given for the remaining three-fourths of the purchase price, payable in three, six and nine months, with interest at the rate of five per cent. per annum. Notes shall be made payable at a bank in the city or town in which the sale is held or at a bank in the city of Ottawa. Cash payments must be made at the time of sale in legal tender or by an accepted cheque on a chartered bank, or by a draft issued by a chartered bank, payable to the order of the Deputy Minister of the Interior. If default is made in any payment required by this section the sale shall be forfeited and void.

The purchaser must also pay the cost or the estimated cost of the survey of the berth before a license is issued.

The licensee shall pay an annual ground rent of five dollars per square mile except for lands situated to the west of Yale, in the Province of British Columbia, in which case the yearly ground rent shall be five cents per acre.

The licensee shall pay the following dues on timber cut on his berth:—

Sawn lumber, 50 cents per thousand feet, board measure.

Railway ties, eight feet long, 1½ cents each.

Railway ties, nine feet long, 1¾ cents each.

Shingle bolts, 25 cents per cord.

And 5 per cent. on the sale of all other products of the berth.

Timber Permits

Yearly permits are granted to settlers, mine operators and others on application to the Dominion Timber Agents, from whom further information can be obtained.

W. W. Cory
Deputy Minister.

Department of the Interior, Ottawa,
December 20th, 1912.

PAPER MILLS---Continued

Bristol

Don Valley Paper Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.
Canada Paper Co., Montreal & Toronto, "King Bristol," "Windsor Bristol," "C. P. S.Tinted Bristol," "Canada Bristol."

Building and Sheathing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que.
British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
Eastern Paper Co., Ltd., St. Basile, Que.
Montreal Paper Co., St. Basil, Que.
Northumberland Paper and Electric Co., Ltd., Montreal.
Riordon Pulp and Paper Co., Ltd., Montreal, Que.
Western Paper Mills, Ltd., Vancouver, B.C.
Jonquiere Pulp Co. Ltd., Jonquiere, Que.
Ford, R. & Son, Port Neuf, Que.
Laurentide Co., Ltd., Grand Mere, Que.
McArthur, Alex. & Co., Montreal, Que.
McLeod Pulp Co., Ltd., Liverpool, N.S.
Walker, J. R. & Co., Montreal, Que.

Cardboard Specials

Hinde & Dauche Paper Co., Ltd., Toronto, Ont.
Jonquiere Pulp Co., Jonquiere, Que.
Macleod Pulp Co., Ltd., Liverpool, N S.
Canada Paper Co., Windsor Mills, Que. "Victor Printers' Blanks," "Superior Translucent Bristol," " C.P.C. Coated Litho," "Superfine Litho Blanks."
Booth, J. R., Ottawa, Ont.
Eddy, E. B. Co., Ltd., Hull, Que.
Laurentide Co. Ltd., Canada Life Building, Montreal, Que.

Carpet Lining

Ford, J. & Co., Port Neuf Station, Que.
Montreal Paper Co., St. Basile, Que.
Northumberland Paper & Electric Co., Ltd., Campbellford Ont.
Wentworth Paper Mills, West Flamboro, Ont.
Western Paper Mills, Ltd., Vancouver, B.C.

Coated

Ritchie & Ramsay, Toronto, Ont.
Georgetown Coating Mills, Ltd., Georgetown, Ont.
National Paper Co., Valleyfield, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.

Corrugated Paper

Lazier Paper Mills, Ltd., Belleville,
Hinde & Dauche Paper Co., Ltd., Toronto, Ont.

Cover

Canada Paper Co., Ltd., Montreal and Toronto, "Tinted Art Cover," "Derby Cover," "Fibrestoc Cover," "Cashmere Cover," "X Cover," "XX Cover."
Eddy Co., The E. B. Ltd., Hull, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Ritchie & Ramsay, Toronto, Ont.

Envelope

Don Valley Paper Co., Ltd., Toronto.
Kinleith Paper Co., Ltd, St. Catherines, Ont.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Felts

Bird, F. W. & Sons, Hamilton, Ont., and Pont Rouge, Que.
Eastern Paper Co., Ltd., St. Basile, Que
McArthur, A. & Co., Montreal, Que.
Ford, J. & Co., Port Neuf, Que
Ford, R. & Son, Port Neuf Station, Que.
Montreal Paper Co., St. Basile, Que.
Northumberland Paper & Electric Co., Ltd., Campbellford.
Western Paper Mills, Ltd., Vancouver, B.C.

Fibre

Canada Paper Co., Ltd., Montreal and Toronto.
Dominion Paper Co., Montreal, Que.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
McArthur, Alex. & Co., Montreal, Que.
Riordon Pulp and Paper Co., Merritton, Ont.
Strathcona Paper Co., Strathcona, Ont.
Wilson, Ltd., J. C., Montreal, Que.

Flour Sacks

Eddy Co., The E. B., Ltd., Hull, Que.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal.

Glazed

Provincial Paper Mills Co., Ltd., Toronto, Ont.

Hanging

Lincoln Paper Mills Co., Ltd., Merritton, Ont.
McArthur, Alex. & Co., Montreal, Que.
Moira Paper Mills, Belleville, Ont.
Riordon Pulp and Paper Co., Ltd., Montreal, Que.
Strathcona Paper Co., Strathcona, Ont.

Kraft

Brompton Pulp & Paper Co. Ltd., East Angus, Que.
Dominion Paper Co. Ltd., Montreal, Que.
Dryden Timber and Power Co. Ltd., Dryden, Ont.
New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que.

Leather Friction Board

Walker, J. R. & Co., Montreal, Que.

News

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
Belgo-Canadian Pulp and Paper Co., Shawinigan Falls, Que.
Booth, J. R., Ottawa, Ont.
Canada Paper Co., Ltd., Montreal and Toronto, "Canada Brand."
Eddy Co., The E. B., Ltd., Hull, Que.
Ford, Joseph & Co., Port Neuf, Que.
Fort Frances Pulp & Paper Co., Ltd., Fort Frances, Ont.
Jonquiere Pulp Co., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Lake Superior Paper Co., Sault Ste. Marie, Ont.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
McArthur, Alex. & Co., Montreal, Que.
Miller Bros. Co., Ltd., Glenmiller, Oht.
News Pulp & Paper Co., Ltd., St. Raymond, Que.
Powell River Co. Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que.
Riordon Pulp and Paper Co., Ltd., Montreal, Que.
Spanish River Pulp & Paper Mills, Ltd., Toronto, Ont.
Ontario Paper Co., Thorold, Ont.

Roofing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que.
Ford, Joseph & Co., Port Neuf, Que.
Ford, Rowland and Son, Port Neuf, Que.
Montreal Paper Co., St. Bazile, Que.
Walker, J. R. & Co., 35 Common, Montreal, Que.
Western Paper Mills, Ltd., Vancouver, B.C.

Straw Board

Ford, J. & Co., Port Neuf, Que.
Lazier Paper Mills, Ltd., Belleville.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
McArthur, A. & Co., Montreal, Que.
Moira Paper Mills, Belleville, Ont.
Northumberland Paper & Electric Co., Campbellford, Ont
Trent River Paper Co., Ltd., Frankford, Ont.
Trent Valley Paper Mills, Glenmiller, Ont.

Tag

Don Valley Paper Co., Ltd., Toronto, Ont.
Eddy, The E. B. Co., Ltd., Hull, Que.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
J. R. Booth, Ottawa, Ont.

Tissue and Toilet

Eddy Co., The E. B., Ltd., Hull, Que.
Garden City Paper Mills, Ltd., St. Catharines, Ont.
Interlake Tissue Mills, Ltd., Merritton, Ont.
Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Que

Wall Board

Beaver Co., Ltd., Beaverdale, Que.
Bishoprick Wallboard Co., Ottawa, Ont.

Wood Board

Beaver Co. Ltd., Thorold, Ont.
Booth, J. R. Ottawa.
Brompton Pulps Paper Co. Ltd., East Angus, Que.
Canada Paper Co., Montreal, Que.
Eddy Co., The E. B., Ltd., Hull, Que.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Northumberland Paper & Electric Co., Campbellford, Ont.
McLeod Pulp Co., Liverpool, N.S.
Western Paper Mills, Ltd., Vancouver, B.C.
Wilson, J. C., Ltd., 61 St. Alexander St., Montreal Que

Wrapping

Booth, J. R., Ottawa, Ont.
Canada Paper Co., Ltd., Montreal and Toronto, "Scotch Fibre," "Invictus Fibre," Hercules Manilla," "St. Fancis Manilla," "Wave Crest Drug."
Dominion Paper Co., Montreal, Que.
Don Valley Paper Co., Ltd., Toronto, Ont.
Eddy Co., The E. B., Ltd., Hull, Que.
Ford, J. & Co., Port Neuf, Que.
Ford, Rowland, Port Neuf, Que.
Gore Valley Paper Mills, Dundas, Ont.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Canada Paper Co., Monreal and Toronto.
See also Kraft.

Writing

Howard Smith Paper Mills Ltd., Beauharnois, Que.
Kinleith Paper Co., St. Catherines, Ont.
Rolland Paper Co., Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Manufacturing Co., Cornwall, Ont.

THE PROVINCE OF ONTARIO

is rich in timber, mineral, agricultural, and other resources.

Ontario has large areas of White Pine and other valuable timbers, her timber products last year representing one-third of the total output of Canada.

Ontario has pulpwood areas practically illimitable, and offers a great field for those desirous of embarking in the pulp and paper-making industry.

Ontario has innumerable waterfalls capable of supplying power for all manufacturing purposes, which are obtainable on reasonable terms, subject to development.

Ontario has large pulp and paper mills in operation at Ottawa, Sturgeon Falls, Spanish River Sault Ste. Marie and Dryden and large plants are under construction at Abitibi on the Temiskaming and Northern Ontario Railway, and Fort Frances on the Rainy River.

Ontario is traversed East and West by three great transcontinental railways, and North and South by three others.

For full particulars as to Ontario's great resources and the advantages offered for large wood-using industries apply to

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Minister of Lands, Forests and Mines
Toronto

Paper Mill Agents and Commission Merchants

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Davis, W. D. & Co., 3rd Street, W., and 7th Avenue.
John Martin Paper Co., Ltd.
Tees & Persse.

Edmonton, Alta.
Tees & Persse.
John Martin Paper Co., Ltd.

Saskatoon, Alta.
Tees & Persse.

Vancouver, B.C.
Brake, Creedon Co., Ltd.
Mitchell Bros., 123 Cordova E.
Smith, Davidson & Wright.

Victoria, B.C.
Mitchell Bros., 8 Bastion.

Moose Jaw, Sask.
Tees & Persse.

Regina, Sask.
Tees & Persse.

Winnipeg, Man.
Barber & Ellis
Clark Bros. & Co., Ltd., 143 Portage.
Ratcliffe Paper Co., Ltd.
Hudson Paper Co.
Kilgour Bros.
Martin, John, Paper Co., Ltd., 319 William.
McAllister & Watts.
McFarlane, Son & Hodgson, Bannatyne and Adelaide.
Tees & Persse.
John Martin Paper Co., Ltd.

St. John, N.B.
Schofield Paper Co., Ltd., 26-30 Prince William.

Moncton, N.B.
Reid, F. P. & Co.

Halifax, N.S.
Eastern Supply & Paper Co., 28 Bedford Row.
Latter, N., 104½ Windsor.
Allen, T. C. & Co.

New Glasgow, N.S.
McGregor, R. & Co.

Kingston, Ont.
Hendry, J. A., 875 Princess.

Hamilton, Ont.
Buntin, Gillies & Co., Ltd., John and Jackson.
Powis, A., 64 King E.

Ottawa, Ont.
Barnard, W. R., 228 Albert.
Reid, C. De Wolf.

Port Arthur, Ont.
Tees & Persse.

Toronto, Ont.
Barber-Ellis Co., Ltd., 71 Wellington Street, W.
Brown Bros., Ltd., 51 Wellington Street, W.
Buntin, Reid Co., 13 Colborne.
Canada Paper Co., Ltd., 112 Bay Street.
Ratcliffe Paper Co., Ltd.
Fisher, E. W., 215 Victoria.
Gaine, T. & Son, 124 Richmond W.
Gage, W. J. Co., Ltd., 84 Spadina Ave.
Hodge-Sheriff Paper Co., McKinnon Building.
Howell, G. A. Co., 10 Wellington E.
Livingstone, H. E. & Co., 80 George.
McNairn, J. H., 5 Jarvis.
Thorne, A. M. & Co., 45 Colborne Street
Victoria Paper & Twine Co., Ltd., 415 King W.
Waters Bros., 33 Front E.
Whyte, Alex., 64 Wellington Street, W.
Wilkinson, E. H., Telephone Building.

Montreal, Que.
Dawson, W. V. & Co., 17 De Bresoles.
Dickinson, John & Co., Ltd., 216 Lemoine.
Little, T. B. & Co., 23 Cote.
Lloyd, Ed., Ltd., Eastern Townships Bank Building
McFarlane, Son & Hodgson, 14 St. Alexander.
Reid, C. DeWolf, Herald Bldg.
Robertson & Parker, St. Paul.
Rolland, J. B. & Son, 14 St. Vincent.
Smith, Howard, Paper Mills, Ltd., 138 McGill.

Quebec, Que.
Andrews, F. H. & Son, 64 St. Paul.
Rolland, J. B. & Son, 36 St. Paul.

Foreign
Salomon & Co., Felix, New York City.
Whitaker Paper Co., Cincinnati, Ohio.
Castle, Gotheil & Overton, New York, N.Y.
Churchill & Sim, Clements Lane, London, E.C., Eng.
Parsons Trading Co., 1 Battery Place, New York.
Pulp and Paper Trading Co., Temple Court Building, New York.
Scandinavian American Trading Co., New York, N.Y.

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YOUNG MAN, ten years experience general office and eight years as head finisher, desires change. Greater portion of time in news, printings, cartridges, etc., lately in kraft. Could take charge of or assist at buying, in wholesale house or mill. Moderate salary until ability proved. Married and sober. Address, Shamrock, Pulp and Paper Magazine, Montreal.

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MANAGER FOR GROUND WOOD PULP MILL, in Central Ontario. Capable of selling product and supervising operations of mill, with suitable foreman. Good opening for right man. State experience and references. Box 77 Pulp and Paper Magazine, Montreal.

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MILLWRIGHTS wanted for new Pulp Mill in Ontario; must be experienced in erection of machinery; state experience and wages required. Abitibi Pulp and Paper Co., Ltd., Iroquois Falls, Ont.

GROUND WOOD SUPERINTENDENT wants new position. Best experience in United States and Canada on high grade pulp. Have had charge of large Canadian mill. Best references from every position held. Apply Box 78, Pulp and Paper Magazine, Montreal.

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OF ALL KINDS AND

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Will save labor
Will not require use of Rakers

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Glens Falls Machine Works
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for Chemical Pulp

TROMBLEE & PAULL ROTARY SULPHUR BURNERS

The MOORE ROTARY SCREEN
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Improved STANDARD GRINDERS

Improved WET MACHINES

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W. N. Munroe, Treasurer
J. A. Bothwell, Gen. Manager

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Boston, Mass.

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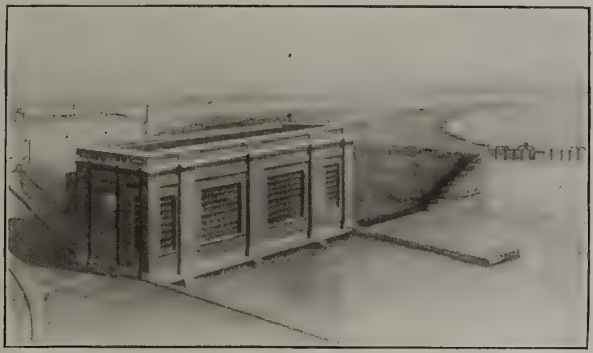

Montrose Power Plant, Merritton, Ont.

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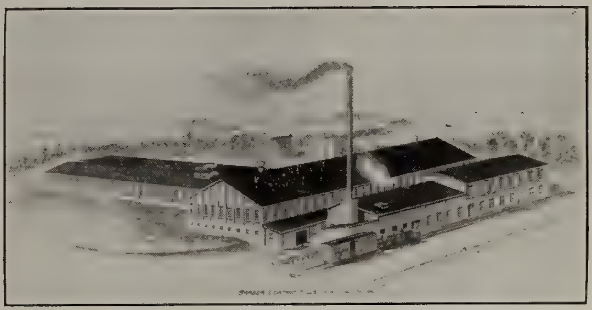

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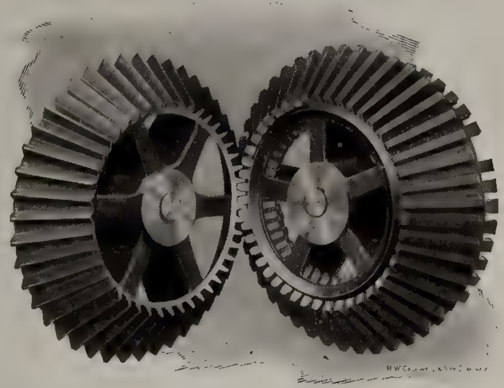

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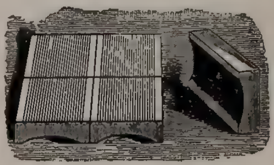

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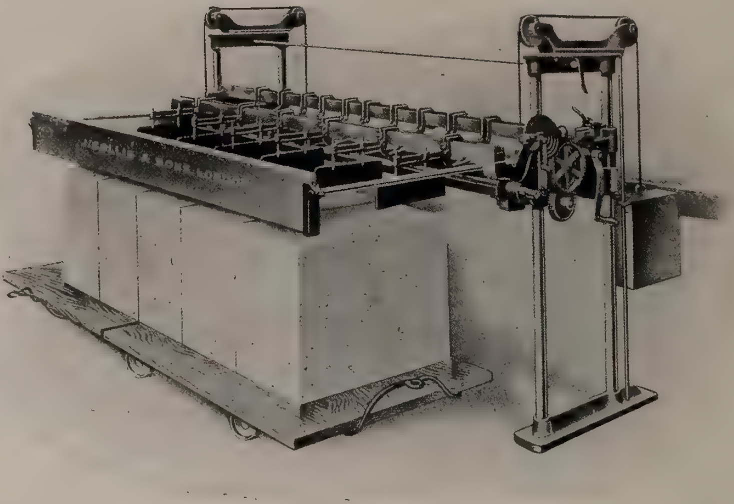

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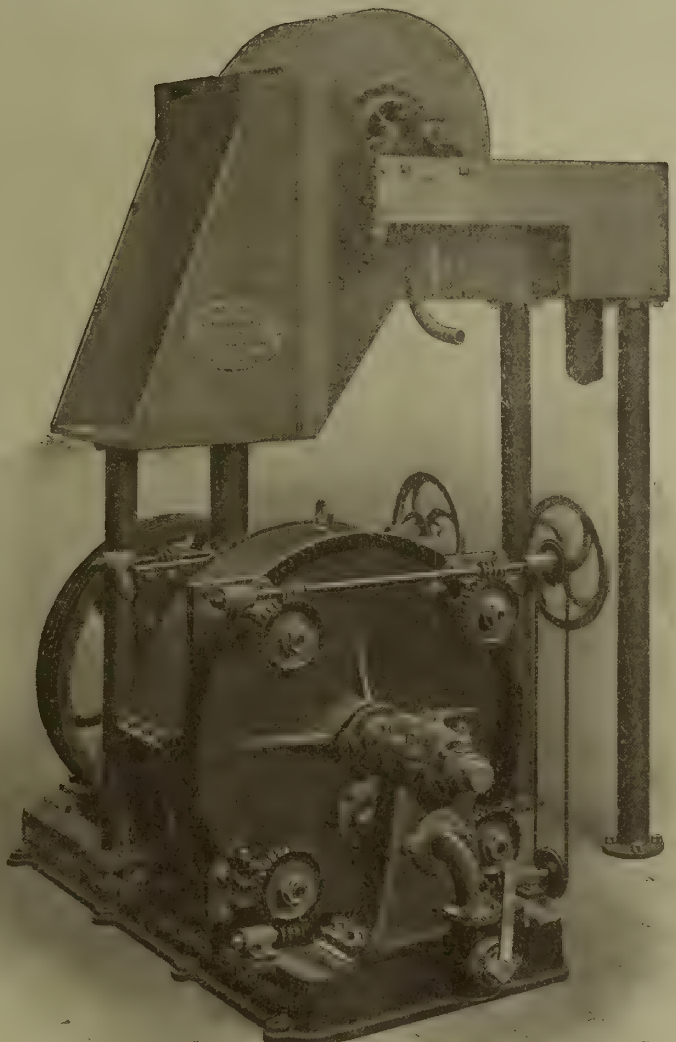

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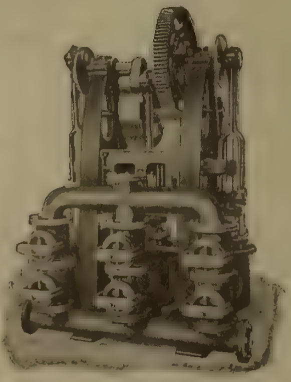

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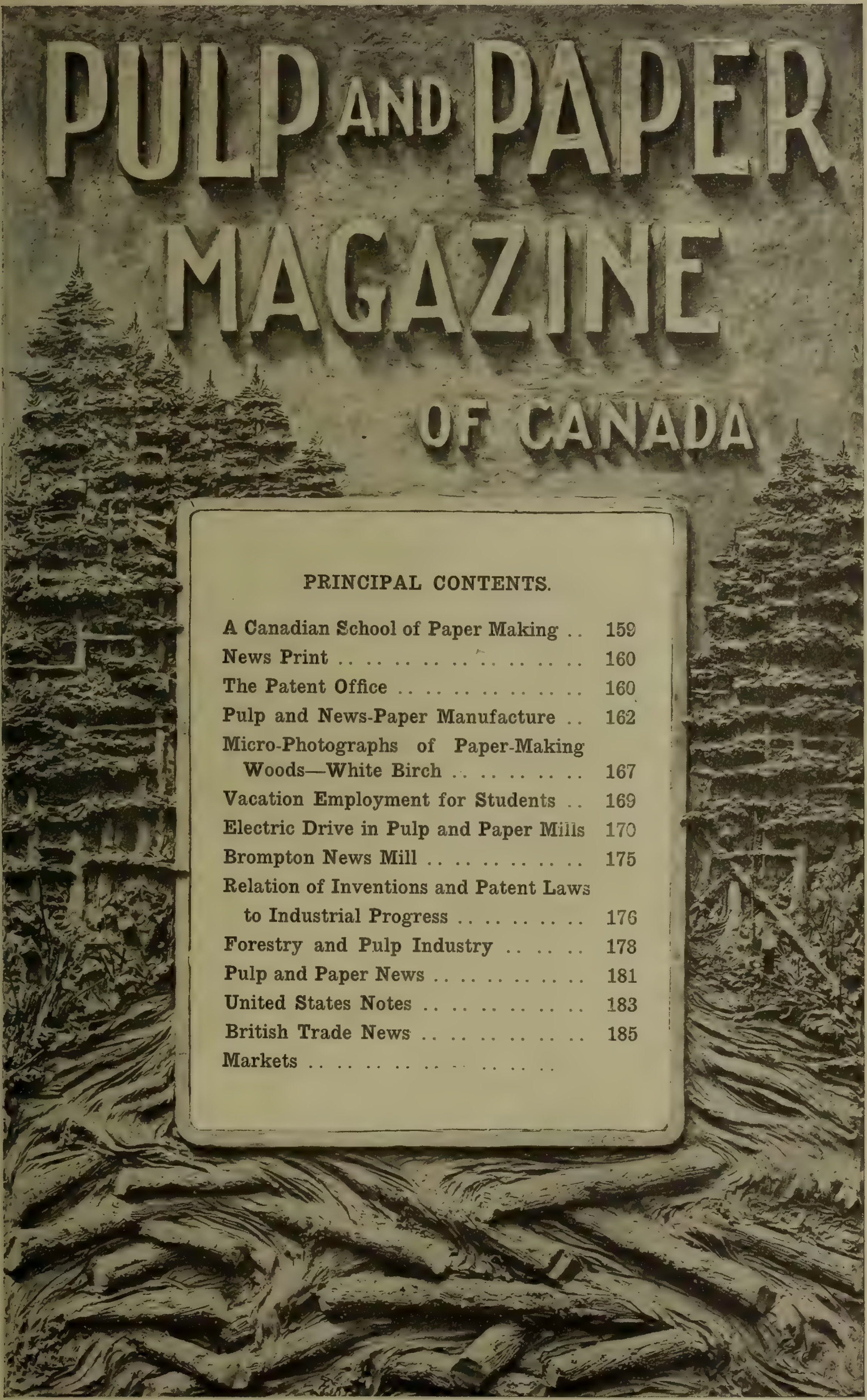

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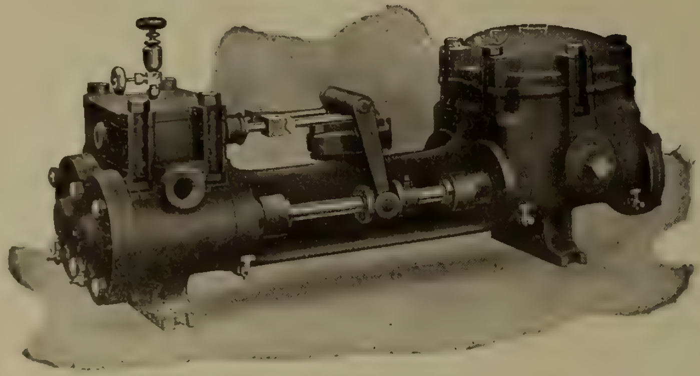

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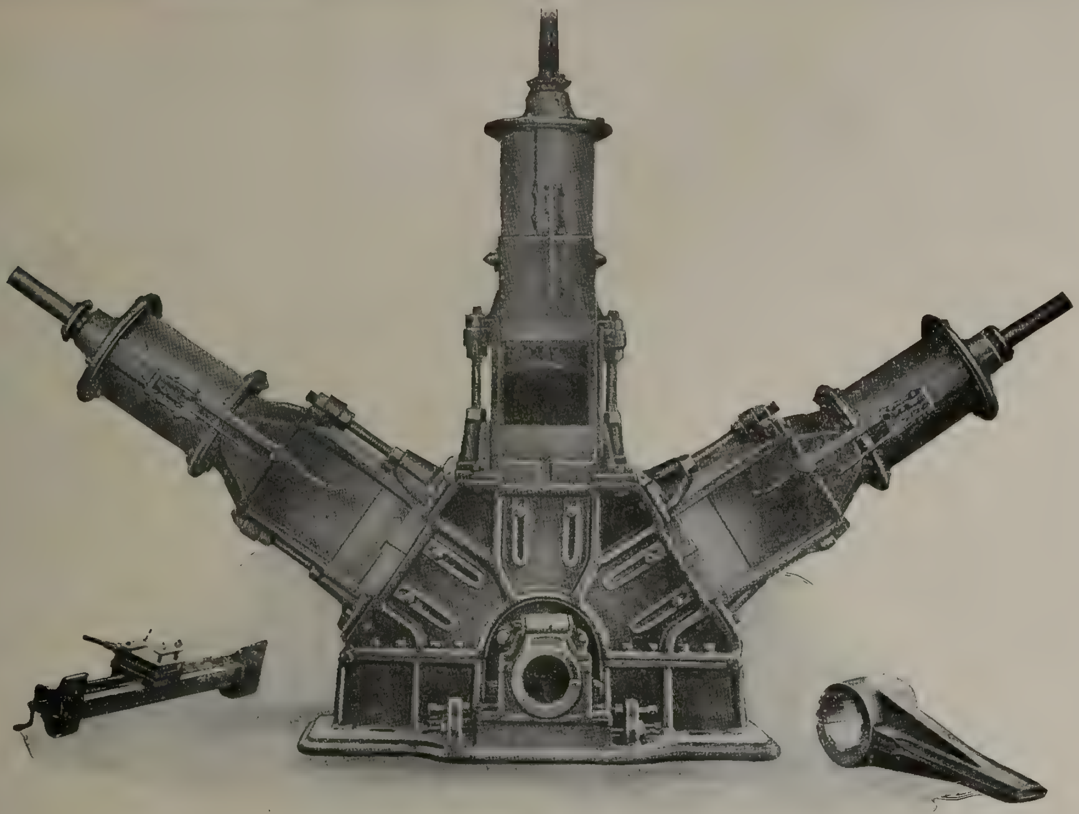

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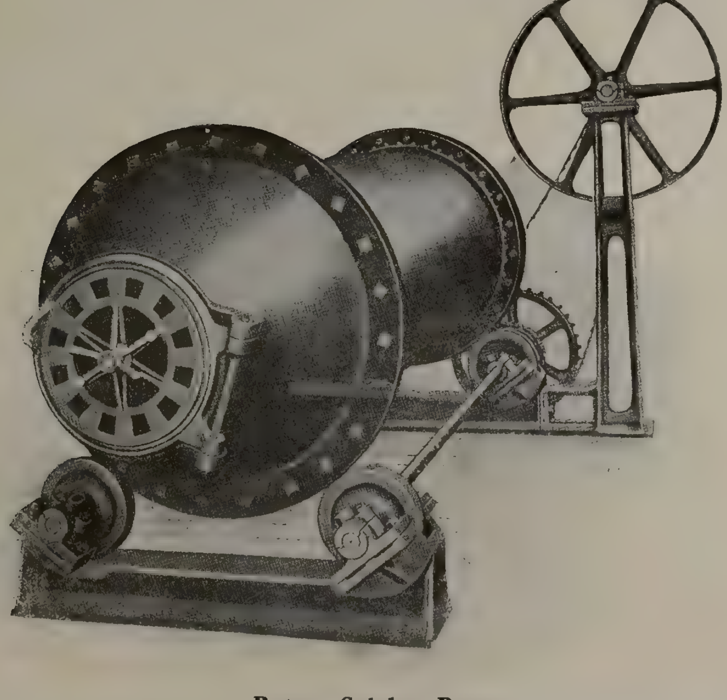

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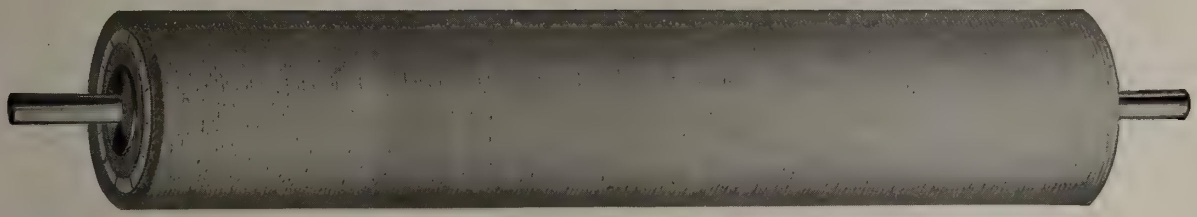

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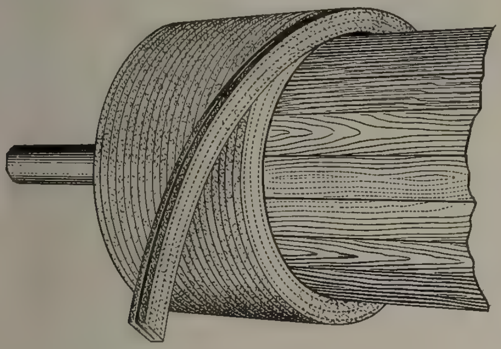

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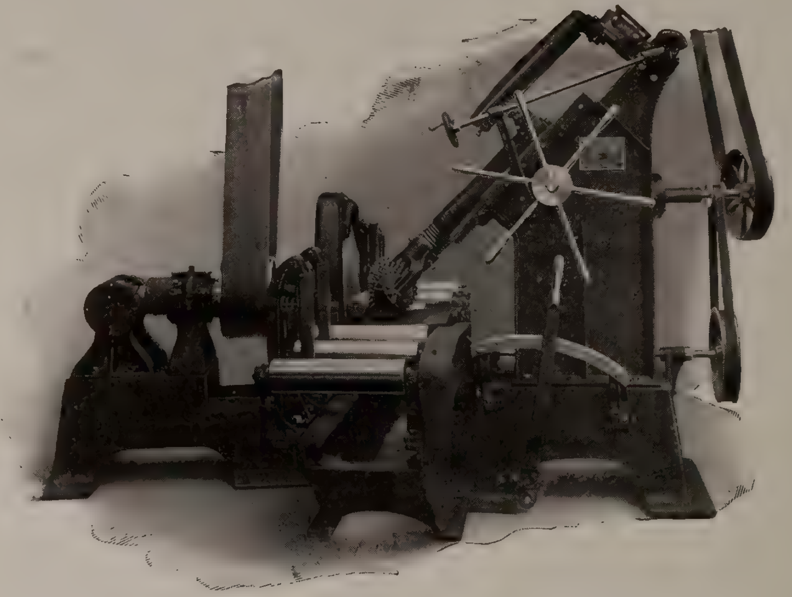

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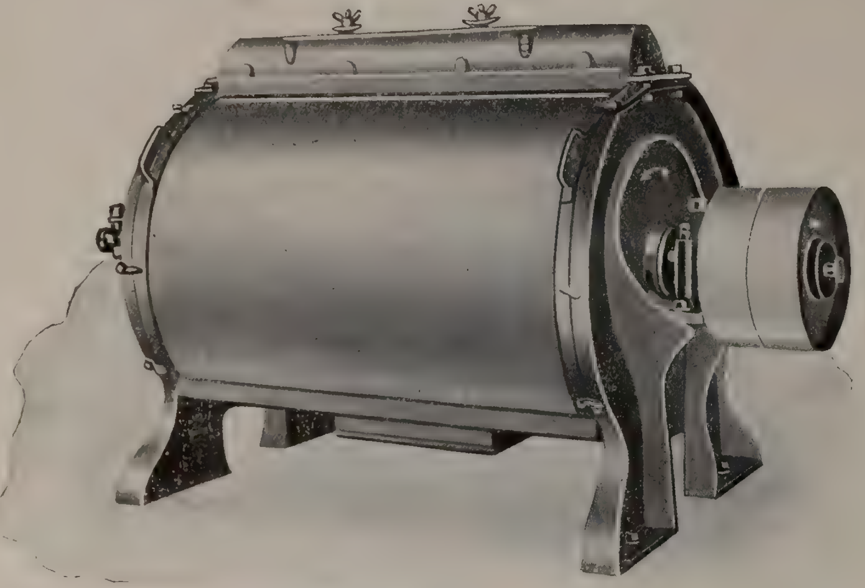

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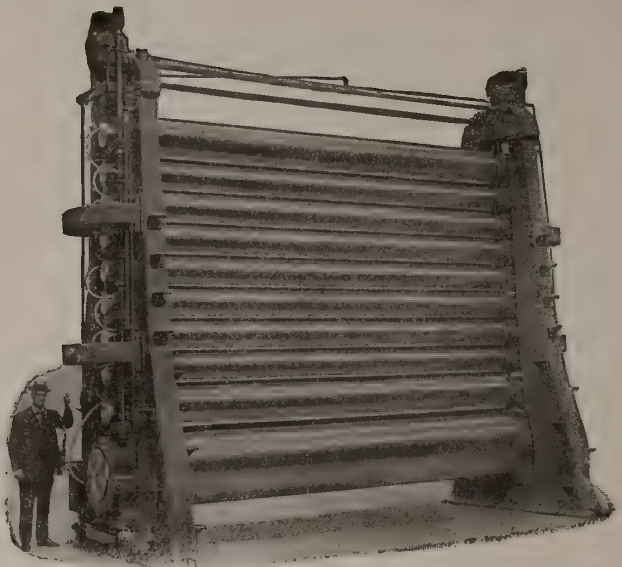

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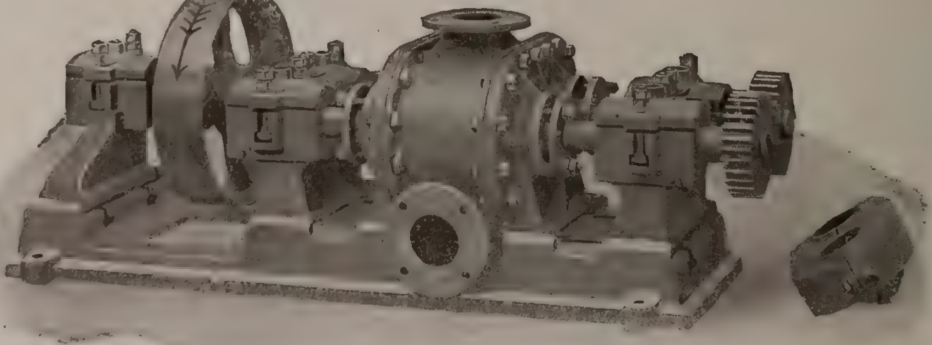

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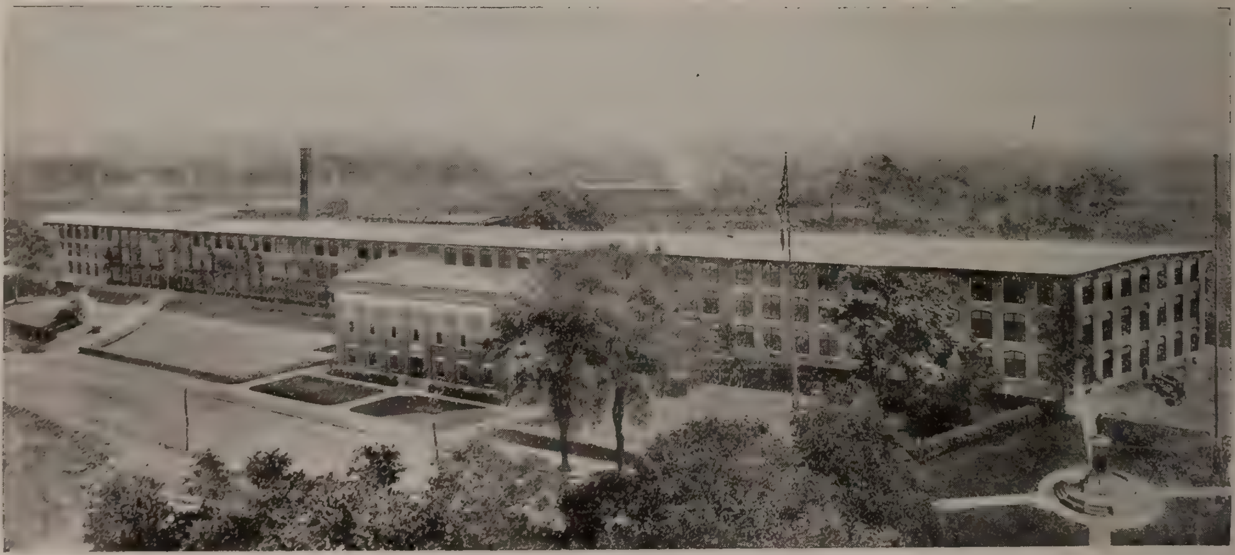

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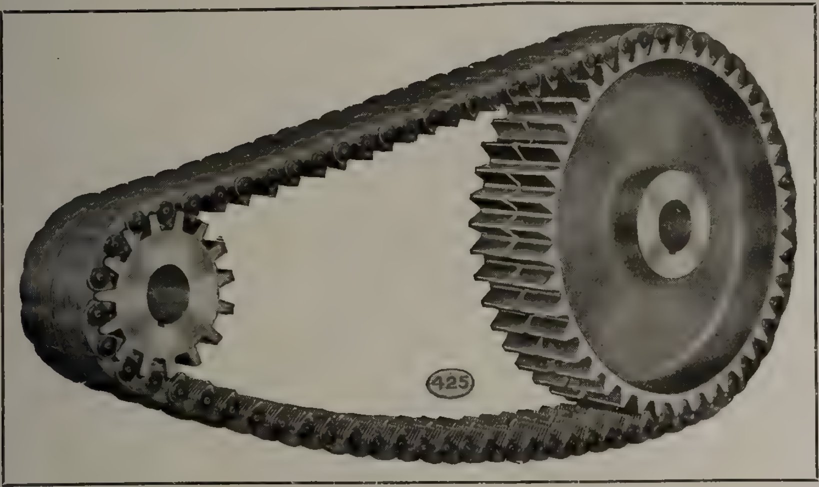

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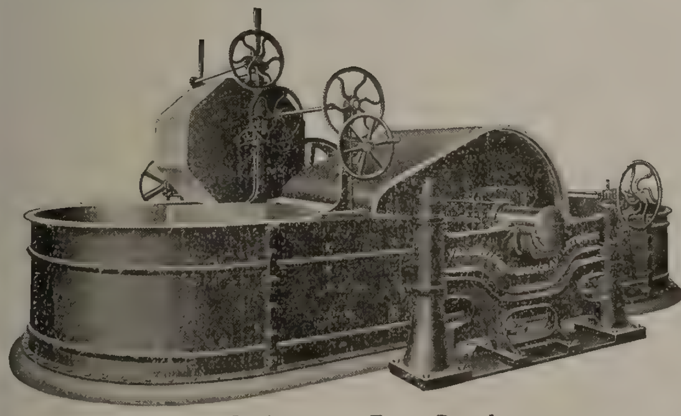

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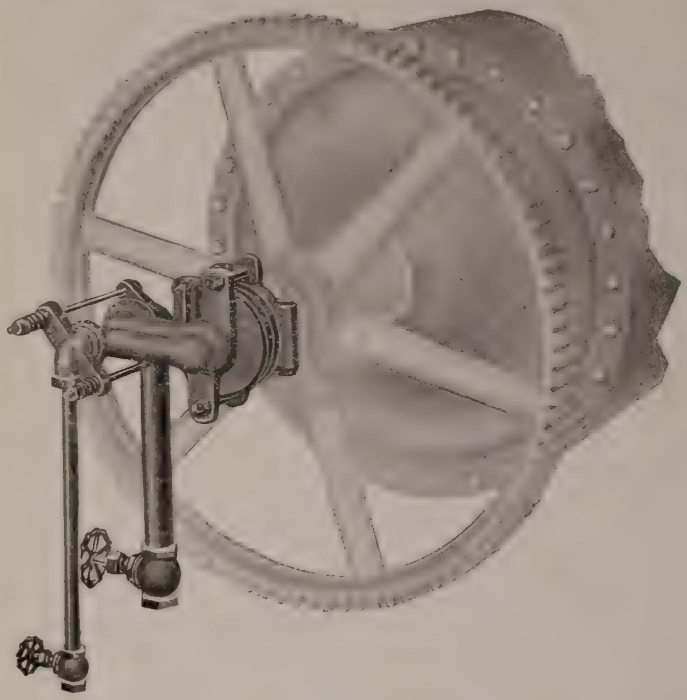

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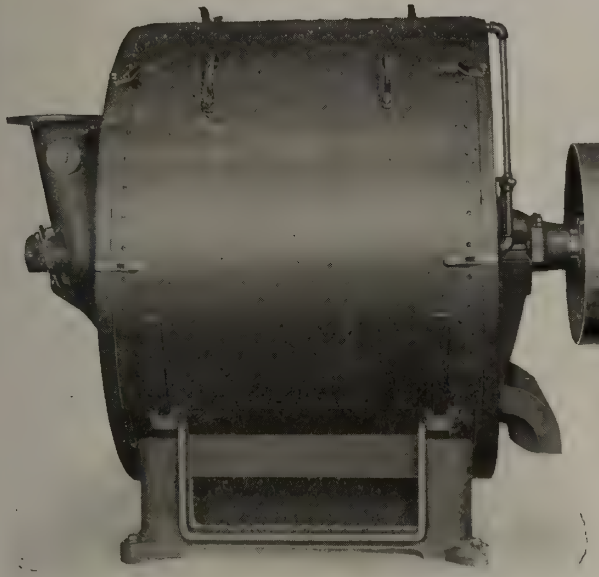

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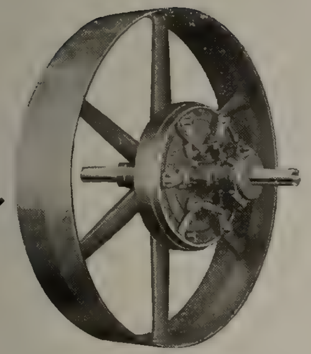

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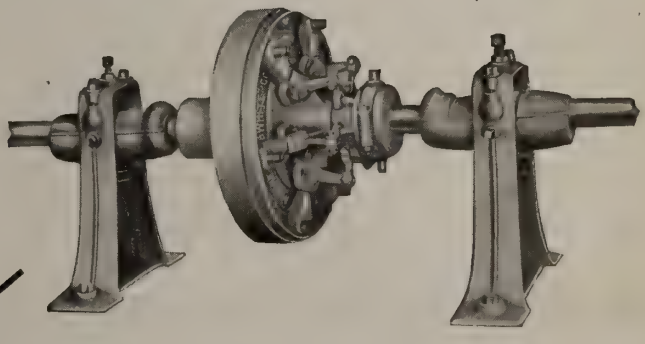

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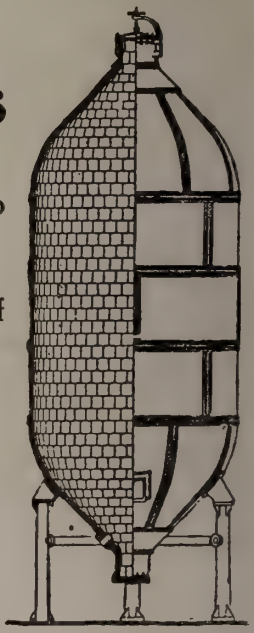

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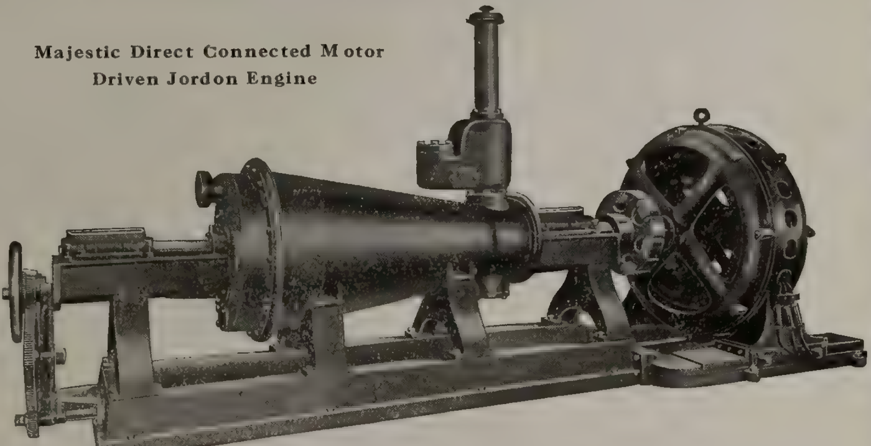

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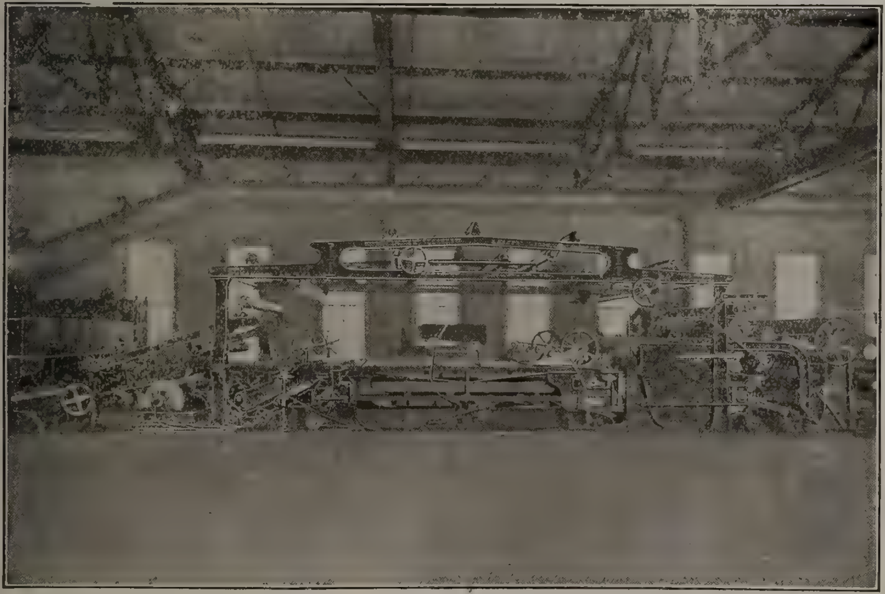

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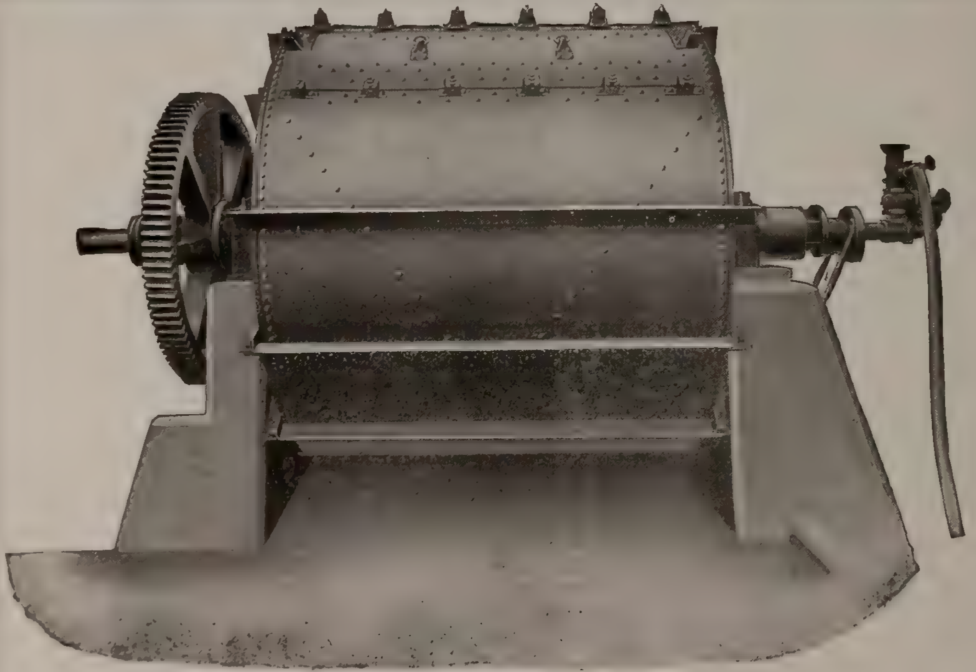

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Pulp and Paper Magazine

A Semi-Monthly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades.

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VOL. XII. MONTREAL, MARCH 15, 1914 No. 6

A Canadian School of Paper Making

Great interest has been aroused in the United States by the address of Ralph H. McKee of the University of Maine, before the American Paper and Pulp Association in New York recently. Mr. McKee is attempting to interest the association in supporting the University of Maine in establishing a School of Papermaking. This is a most healthy step by the American Paper Industry and, coupled with this, the fact that McGill University has taken a similar step in this country, leads us to believe that something definite and of real benefit to the pulp and paper industry will soon result. The present method of developing a man to responsible positions by the path of promotion from "broke boy" is no longer sufficient to supply our important positions in the mills with suitable men. Most other large industries have met this need, which they felt, by such schools. The electrical industry, for example, has long enjoyed technical schools to draw from. The textile industry has also established trade schools, and we would not think of employing a physician who had obtained his training by starting as a young man in a doctor's office and with no more training than what he could pick up unaided. The pulp and paper industry has grown to such proportions that it requires skilled men to take the places in charge of the various departments of the mills. Some scheme of co-operation with the manufacturers, McGill University and Forest Products Laboratories could be worked out which could supply this need. It will be possible in Canada now to obtain from McGill University chemical engineers who have had considerable training in pulp and paper making. They will there have the advantages of the experimental equipment of the Forest Products Laboratories, which is the best in the world and is being fitted up on an elaborate scale. But there is another problem which must be solved, that is, there should be afforded a school where it would be possible to get a one or two months' course at paper making, such as is given by Agricultural Colleges to the sons of farmers.

It looks now as though some solution of this problem was in sight by having a summer school in Montreal which would be under the direction of the new Forest Products Laboratories and would be held at the same time as the McGill Summer Schools. This would give the students an opportunity to take the necessary lectures with the engineering students, on those subjects which they require and spend a good deal of their time in practical laboratory work. This could be followed up by a few weeks in the paper mills nearest to Montreal under the charge of a suitable man. It is hoped that paper manufacturers will co-operate with this scheme in two or three ways. First, that they should take students in chemistry, mechanical, and chemical engineering during the summer holidays, paying them sufficient to meet their expenses. The exact nature of the work given them is of little importance. The important thing is to give them an opportunity to see how men and mill machinery are handled. It is possible to obtain such students at wages between $50 and $60 a month and it is always understood that the mills giving employment to these men in the summer have first chance to obtain them upon graduation. The first two weeks it is likely that the students will not fully earn his pay, but at the end of the first month if he is not fully earning his pay, he should be fired, because he does not belong to the business. If manufacturers would co-operate with the above institutions, it is fairly certain that it will be possible to work a scheme which will meet a long felt need. We are far behind the older countries, many of whom have done considerable in this direction. Germany and Sweden have organized such schools and, to-day, practically every superintendent of a mill in these and other European States is a technical graduate.

France's school of papermaking, now one of the best, was not started until seven years ago, when the French Union of Papermakers subscribed the equipment and $1,200 a year for running expenses. In 1913 their yearly subscription for running expenses was increased to $6,000. In France there has been no question but that the benefit to the industry in these seven years has been many many times over the cost of this school. There is also a well equipped school of papermaking at the University of Manchester.

Let the Canadian Pulp and Paper Association and all manufacturers heartily co-operate with this movement.

News Print

A Montreal daily has sounded a timely warning in connection with the manufacture of news print paper in Canada. It points out that the newspaper industry is now benefitting by the new American tariff, and that many new Canadian mills are being established, and under contemplation, for the manufacture of news print, which will displace the older mills in United States. They are wrong in their figures, but there is no doubt but that the output will increase between fifty and sixty per cent in that time. They further suggest that our continuance in business is dependent upon American goodwill, and their keeping news on the free list. They also suggest that American news print manufacturers, are organizing against free trade in news print and will take action at the coming American elections. Canada will have built up within two years a large news print manufacturing industry, but we do not anticipate the sad calamities which the Montreal daily points out. It is true that a tariff against our product would have a bad effect on this industry, but we do not believe they will ever make the tariff sufficiently high to shut us out of their market. Looking at the situation as a whole, it would be practically impossible for the United States to shut Canadian news print out of their market. The suggestion that this will provide them a big club to hold over Canada in demanding tariff concessions is entirely wrong. We have a return club, which is far more potent, that is, the prohibition of the export of our wood. As long as they admit free news print we would not be in a position to prohibit this export. But the minute that the United States excluded us from their market by an insurmountable tariff, we would, of course, have no other alternative but to prohibit the export of our wood to their mills. This would have the effect of raising enormously the price of wood in the United States, which would similarly raise the price of news print to a point where we could afford to pay the duty. The scare that Germans are landing news print on the sidewalks of New York two dollars less per ton than Canadians, is not well founded. We will never have any difficulty whatever in competing with German news print. We do not feel that there is any need to worry over our increasing shipments to the United States, except that possibilities do point to a rather too elaborate development in this line, and it would be well for those interested in new news mills to consider well their locations before finally deciding to build.

The Patent Office

An article in this issue by Mr. DeCew, the well-known engineer of Montreal, deals with a most pertinent subject in the pulp and paper world, that is, the Canadian Patent Office. The United States and Canada are both very far behind foreign countries in the administration and competence of our Patent Offices. Technical men are continually complaining of the gross injustice under which they suffer through inefficient staffs and red tape. It frequently takes years to have a patent completely put through, after a great deal of humbug. That this condition is of benefit to an industry which finds it necessary to operate under many patents is a gross misconception. To encourage development in our industries, we must encourage men with the technical training to develop new ideas and promote new processes. It is, of course, true that the name inventor is in disrepute. When a man appears calling himself an inventor, it is usually a sure sign that he is either a faker or, at least, is misguided. But there are those working in all industries for its advancement along technical lines who need protection and encouragement, and returns to such industries will be many fold, when such protection and encouragement is afforded. The days are past when a person can, by a patent, hold up the country and bleed the people. It is fair, of course, for any man, owning a new and useful process, to secure considerable benefit, but it is practically impossible in these days for such a man to perpetrate injustices on his fellows. There are still, of course, cases of extortion by men owning patents, but these are gradually being forced into the minority division. To benefit these conditions in Canada, at least, it seems to us that immediate action is necessary by the Government, in whatever means it may deem most advisable and efficient, to remedy the mistakes of this department at Ottawa. The chief difficulties with the present Patent Office are: First, the attorneys have not suitable facilities for search since there is no reliable index, and there are rumors that some attorneys have free access to the private documents; second, there are no printed copies of Canadian Patents available; third, the officer in charge of the Patent Office has neither legal nor technical training, and many of the examiners are grossly incompetent; fourth, secrecy of applications on file is not guarded as it should be. There have been cases when copies were lost: fifth, there is but one copy of files of Canadian patents and relative correspondence; sixth, one copy must be used by all searching for information. It is highly important that the Government should give investors honest treatment and fair protection.

CHEMICAL UTILIZATION OF SOUTHERN PINE WASTE.

The two articles by John S. Bates on this subject in the issues of January 15th and February 1st have aroused a good deal of favorable comment throughout the United States and Canada. The work upon which these articles was based was done in the Laboratory of Engineering Chemistry, Columbia University under the direction of Professor M. C. Whittaker, and not in the Research Laboratories of Arthur D. Little Inc., as the headings of these articles might be construed to state. Mr. Bates, however, is now a member of Mr. Little's staff, having been asked to associate himself with Mr. Little on account of the recognition of his very high value as an investigator in pulp and paper work. We feel sure that the articles have merited the large amount of comment they have brought, and that Mr. Bates is to be complimented on the process which shows such promising developments on an experimental scale.

EXPERIMENTAL BASALT LAVA BEATER ROLLS.

Arthur D. Little Incorporated, of Boston, Mass., who early in 1912 erected an experimental paper mill for the purpose of supplementing their chemical experiments with practical tests, have placed an order with J. Marx Co., of London, Eng., for a Basalt Lava Beater Roll to replace the steel roll, which is at present installed in their wooden Hollander, which has a capacity of about 50 lbs. of air dry stock. The dimensions of this new roll will be 18 in. face by 24 in. diameter.

This firm has also ordered a Crystalline Stone Press Roll for use on the first wet press of their 29 in. Fourdinier machine. This press roll will replace their present roll, which is brass.

This Company deals in problems in pulp and paper mill operations and their order for the above equipment is in development with new processes and the conservation of fibrous products used by paper makers.

A number of the large Canadian mills have, for some time past, been using Basalt Lava Rolls with great success, but the above is one of the first installed for experimental work on this side, and Process Engineers Limited, of Montreal, who are the American representatives for J. Marx & Co., are extremely gratified to think that an organization such as this, which is headed by Arthur D. Little, a paper mill chemist of international reputaion, who has been associated with pulp and paper mills since the earliest days of the sulphite process and whose organization consists of chemists and engineers of wide experience, have shown their interest and approval in this new departure in beating tackle, by placing an order with them.

The Agasotte Millboard Co., of Trenton. N.J., have also placed an order with the same firm for Marx Patent Single Beater for experimental work.

This beater will have a capacity of 40 lbs. of air dry stock and will be equipped with Basalt Lava Stone Beater Roll and stone Bedplates. This small experimental beater will contain all of the latest improvements.

The trough will be built of reinforced concrete, and will have a wide mid feather which serves to house the drive. The back fall is very high so as to permit a steep and continuous fall all the way down to the emptying valve. The bottom is curved and dished in such a manner as to insure quick mixing and uniform travel throughout the beater. The diameter of the roll is 24 in. and 18 in. on the face.

This minature beater will be in all particulars similar to the commercial beaters as supplied by J. Marx & Co.

The roll will be fitted with counter balancing device enabling pressure of the roll to be regulated and varied at will. This counter balancing device is arranged with a graduated scale in such a way that similar beating effect can be repeated on similar furnishes by simply sliding the counter weight along to a given position.

The main feature of the Marx Beaters are, high speed of travel, reduced power consumption per ton of stuff, speedy and thorough mixing of the stock at high consistency, i.e., the Marx Beater works from 7½ to 10 per cent air dry stock. Decrease in beating time, low maintenance costs, easy and convenient manipulation.

Mr. D. M. Sutherland, the Manager, of the Agasotte Millboard Co., will use this beater for experimental and research work. Whether the beater will be installed in Canada or the U.S. has not yet been decided.

Process Engineers, Limited, of Montreal, who are the Canadian representatives and sales agents for the Marx Beater, report that great interest is being taken by Paper and Pulp Manufacturers with reference to the various uses of Basalt Lava as a material for Beater Rolls. The discovery of its value for refining as well as for Beating has largely increased the demand for this material.

ACCIDENT IN BOOTH CAMP.

George Robeshean and Zevin Chock, two foreigners, who were seriously injured in a dynamite explosion, near Killaloe, Ont., in one of the camps of the J. R. Booth lumber and paper firm of Ottawa, were brought to this city this week. Robeshean lost a leg in the explosion while Chock's skull was fractured. Accidents of this kind are comparatively rare in lumber camps.

PULP AND NEWS-PAPER MANUFACTURE

By J. STADLER, Shawinigan Falls, Que.

The subject of this paper is the power consumption in the manufacture of news-paper, and in the production of the fibre for the making of the paper, that is, the ground-wood and sulphite process.

The fibre used in the making of news-paper is praduced entirely from wood. The wood used is principally spruce, hemlock and balsam. The other coniferous woods are used in smaller quantities.

News-paper is usually manufactured from 75% mechanical pulp (ground-wood) and 25% chemical pulp (sulphite pulp). Under ordinary conditions one cord of wood is required to make one ton of ground-wood, and two cords of wood are required to make one ton of sulphite pulp; hence for the production of news-paper one and a half cords of wood make 1.25 ton of news-paper made.

That Canada may be classified as a papermaking country can be seen from the following figures:—

	Daily Production	Production in tons per annum	Value of Product (Dollars)	Daily H.P. required per 24 hrs.
Mechanical Pulp................	3,180 tons	800,000	12,400,000	210,000
Chemical Pulp..................	905 tons	272,000	10,336,000	7,500
News-paper.....................	1,580 tons	480,000	18,240,000	20,000

In addition to the above, Canada is producing large quantities of chemical pulp made by the sulphate and the soda processes, from which paper is made under the classes of Kraft, packing, book and writing papers; these papers, however, will not be considered here.

From the above it will be seen that in the news-paper industry there is a daily output of 237,500 H.P., of which the principal amount is used in the production of mechanical pulp.

A number of ground-wood mills do not operate the entire year round to full capacity for lack of motive power.

The power requirements per ton of finished product may be taken as follows:—

Mechanical Pulp 1,200 to 1,920 H.P. hours=50 to 80 H.P. per 24 hours.

Sulphite Pulp 144 to 240 H.P. hours=6 to 10 H.P. per 24 hours.

News-paper 252 to 384 H.P. hours=10.5 to 16 H.P. per 24 hours.

The costs of plants are shown in diagram No. 1 and the figures are based on modern installations built to manufacture at lowest cost.

The writer is of the opinion that the heretofore prevailing custom of building plants for the paper industry with a view to low first cost will be discontinued as such plants do not manufacture economically.

In the paper industry, like any other industry where motive power is used, constant speed is of importance, yet where a number of plants have been visited it is found that little has been done to provide this very important condition in the operation of the machinery employed. Investigations made have demonstrated that speed variations influence the quality and quantity produced to a very great extent and because of its easy application and constant speed, electric power is becoming more used in the news-paper and other industries.

Manufacturers of paper mill machinery should give more attention to the construction of machinery for direct connected electric drive, as generally the power required by the different machines is of such magnitude that small groups may be operated in such a manner very efficiently.

The Mechanical Pulp or Ground-wood Plant

It is only within the past few years that ground-wood pulp mills have been located remote from water power, and have used electrical energy for their operation.

In view of the large amount of power required, the location of such mills must be at places where low-priced power is available.

The ground-wood process may be briefly followed by referring to Diagram No. 2, in connection with the following table:—

Apparatus	Approx. H.P. hours required per ton Air Dry Pulp	Approx. ratio of product to water	Performance of Apparatus
A Conveyors..........	2 to 6		Delivering wood to plant
B Grinder.............	1025 to 1596		Grinding solid wood to fibre
C Coarse Screen.......	3 to 6	1:350	Separating coarse slivers from fibre
D. Fine Screen........	36 to 60	1:350	Separating fine fibre from coarse fibre
E. Refiner.............	50 to 100	1:20	Reducing coarse fibre to fine fibre
F. Wet Machine........	30 to 50	1:3	Separating water from fine fibre
G. Pump..............	24 to 60	1:350	Lifting pulp and water to required height
H. Pump.	20 to 40	......	Lifting clear water to spray pipes
I. Cooler..............	......	......	To absorb heat produced at "B"
Total.................	1200 to 1920 or from 50 to 80 H.P. per ton on 24 hr. power		

N.B.—Cooler is only given to show ideal installation in actual practice. Sufficient fresh water is supplied to keep temperature within desirable limits; the surplus water thus introduced in the process is generally permitted to run to waste, which quite often causes an appreciable loss of fine fibre.

The writer is of the opinion that in the future ground-wood mills will be especially constructed with a view to using power from large hydro-electric plants at such hours of the day as the load is low, in order to raise the load factor of the power plant.

The progress made in the past few years with automatic pulp grinders facilitates such an installation. In order, however, to keep the investment as low as practicable, the writer would propose to operate the auxiliary machinery of such a plant for twenty-four hours, and the grinders which absorb the bulk of the power for about 12 hours per day. Such a plant runnning only part of the year would not give steady employment to the help needed, and would, therefore, lead to inefficiency in operation Such a ground-wood mill could, however, be operated in connection with a paper mill, where a steady power for practically the whole year round is essential. With this in view, the following has been prepared.

Reference to Diagram No. 2, of ground-wood process, shows that operation "A" requires 2 to 6 H.P. hours.

Operation "B" requires 1,035 to 1,596 H.P. hours.

Operation "C" to "H" inclusive requires 162.5 to 316 H.P. hours.

Estimating on the construction of a plant making 30,000 tons per year, based on 300 operating days, or 100 tons per day, Item "A" would be operated in daytime only; Item "B" at night only; Items "C" to "H" during 24 hours.

The electric power is assumed at $16.00 per H.P., per annum, from 7 a.m. to 7 p.m; at $8.00 per H.P. from 7 p.m. to 7 a.m., which figures at 0.22 cents and 0.11 cents per horse-power hour respectively.

As an alternative, take a plant operating 24 hours, except Item "A," which is operated during the day only, at a fixed power cost of $16.00 or 22 cents per horse power hour:—

	No. 1—Full power, 12 h.			No. 2—24-hour power		
		per annum	per ton		per annum	per ton
6% interest on capital invested..................	$450,000	$27,000	$0.90	$300,000	$18,000	$0.60
10% depreciation on auxiliary equipment.........	100,000	10,000	.33	100,000	10,000	.33
6% depreciation on main equipment and buildings...	350,000	21,000	.70	200,000	12,000	.40
Day power at 22 cents per hour....................	100 H.P. hours.........		.22	702.5 H.P. hours........		1.55
Night power at 22 cents per hour....................	....		..	697.5 H.P. hours.......		1.53
Night power at 11 cents per hour....................	1,300 H.P. hours........		1.43	....		..
Total cost per ton..........	....		$3.68	....		$4.41

P.S.—In the foregoing table it is assumed that 5 H.P. hours are required for "A"; 1,205 H.P. hours are required for "B"; 190 H.P. hours are required for "C" to "H."

The power requirements are taken low for a plant of that size, but any increase in power consumption would be more in favour of the low priced power.

It will be noticed that the plant No. 1 operates with about 830 H.P. load for 12 hours, and 10,800 H.P. for the other 12 hours, whereas plant No. 2 operates on a practically steady load of 5,850 H.P.

The resulting economy of plant No. 1 over No. 2 is 73 cents per ton on the power figures assumed. Pro rata computations can be made for any other power cost.

As already stated, the writer does not advise operating individual ground-wood plants for part of the year only. Such plants would become quite expensive, and the fixed charges per ton of product would be quite high; furthermore, ground-wood depreciates in value with age, and such a plant would have to store large quantities of ground wood to supply the market as required.

Chemical Pulp Mill

There have been a number of mills located at places where no hydraulic power is available. Transportation facilities for the supply of materials used in the manufacture, and the marketing of the finished product, are also large factors in the location of a plant of this kind. The plant requires in addition to the two cords of wood per ton of pulp made, sulphur, coal, and lime, amounting in weight to over one-half a ton for each ton of pulp made.

The power requirements of the sulphite pulp process may be obtained by referring to Diagram No. 3, and to the following table:—

Apparatus	Approx. H.P. hours required per ton	Performance of apparatus
A. Wood Conveyor...........	4 to 8	Delivering wood to plant
B. Chipper....................	16 to 24	Reducing blocks to small chips
C. Screen.....................	1 to 2	Sorting wood chips
D. Chip Conveyor............	3 to 6	Delivering chips to bin
E. Chip Bin..................	....	Storing wood chips
F. Digester...................	....	Reducing wood to pulp
G. Wash Tank...............	....	Washing pulp
H. Stock Tank...............	2 to 5	Storage of washed pulp
I. Circulating Pump..........	30 to 60	Lifting diluted pulp
J. Coarse Screen..............	1 to 3	Separating knots from fibre
K. Fine Screen...............	14 to 25	Separating fine from coarse fibre
L. Wet Machine..............	25 to 35	Separating water from pulp
M. Knot Reducer............	(not considered)	Reducing knots, etc., to low grade pulp
N. Acid Making..............	48 to 72	Making and delivering acid to digester
	144 to 240	6.0 to 10 H.P. per 24 hours

From the first cost of such a plant as shown on Diagram No. 1 it is apparent that in view of the small amount of power required, no economy would be effected by using only restricted power.

Such an installation requires in addition to motive power, heat in the digester, shown in Diagram No. 3, under letter "F," where the wood chips are boiled in a solution of sulphurous acid, under about 80 lbs. steam pressure. The amount of heat required varies considerably, depending on the method employed in the working of the wood. While this demand is very irregular it is assumed in general practice that boiler capacity sufficient to deliver hourly 1,000 lbs. steam per ton capacity of plant per 24 hours is necessary. From this it will be seen that at a moderate price of coal the motive power required can be produced by a slight allowance in the capacity of the sream plant.

Large quantities of water are required in the manufacturing process, and the water should be comparatively clear as any impurities carried in it are likely to remain in the pulp and thus affect the value of the finished product.

The power consumption required for the water supply has not been considered and it would depend entirely on local conditions.

Paper Mill

In so far as the writer is aware, no news-paper mills have been built close to the point of consumption in Canada, but in countries which import the raw materials for the manufacture of paper, mills have been built in proximity to large towns. In Canada all the mills making news-paper produce their own ground-wood pulp, and quite a few of them also make their own sulphite pulp. There is a decided advantage in combining the three processes, viz.:—ground-wood, sulphite pulp and paper mill, while such a plan results in a somewhat lower first cost of the plant, its main economy is in the manipulation of the raw materials.

A news-paper mill may be located at any place having good transportation facilities for the supply of raw material and for disposing of the finished product. Since in this class of manufacture, a more highly skilled grade of labor is necessary than in the production of pulp, the location of the mill with reference thereto must also be considered, especially as a low efficiency of the labor may very much increase the cost of production.

The power requirements may be followed by referrring to Diagram No. 4, and the following table:—

Apparatus	Approx. H.P. hours per ton finished paper	Approx. ratio of product to water	Performance of apparatus
A. Beater or refiner	70 to 120	1:25 to 1:14	Preparing paper fibre
B. Stuff chest	3 to 5	,,	Reservoir for paper fibre
C. Stuff pump	2.5 to 5	,,	Pump to elevate same
D. Stuff screens	8 to 15	1:250	To remove impurities
E. Circulating pump	10 to 22	1:250	Circulate water used in formation
F. Vacuum pump	0.5 to 1.0		To remove water from paper web
G. Fourdrinier part	150 to 200	when leaving apparatus 1:7 to 1:2.3	Formation of paper web
H. Wet presses		Dry	Mechanical removal of water
I. Dryers		,,	Thermic removal of water
J. Calenders		,,	Polishing paper web
K. Reels		,,	Reeling paper web
L. Rewinder	8 to 16	,,	Cutting paper web
	252 to 384 H.P. hours—10.5 to 16 H.P. for 24 hours		

Power for items G to K is preferably supplied by the steam engine, using the exhaust steam in the dryers.

The dryers, item "I," require approximately 3 lbs. saturated steam at 0 to 10 pounds pressure per pound of paper made on the machine.

The steam engine driving the machine in a number of installations is made to drive all items above listed, except (A) the beater or refiner. By doing so, too much exhaust steam is generally produced, causing considerable waste of heat.

It is preferable to instal individual electric or group drives for all items except "G" to "K" inclusive. When the cost of motive power is low, there is some economy in driving all parts by electric motors, but it is very essential for the machine part proper (items "G" to "K" inclusive) to be connected to a circuit causing no variation of speed on the motors.

On machines operating at over 600 feet paper speed per minute, a sudden variation of one per cent. (1%) may cause the paper to break.

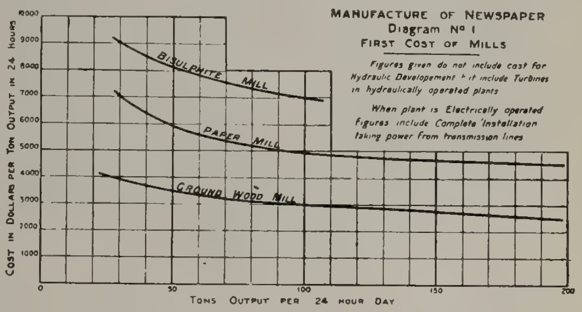
From the above it is apparent that a minimum 102 H.P. hours are required for the preparation of fibre and the driving of auxiliary apparatus in connection with the paper machine. Power requirements are, therefore, not so important a factor in the location of the paper but that preference may be given to close proximity to the market for the finished product.

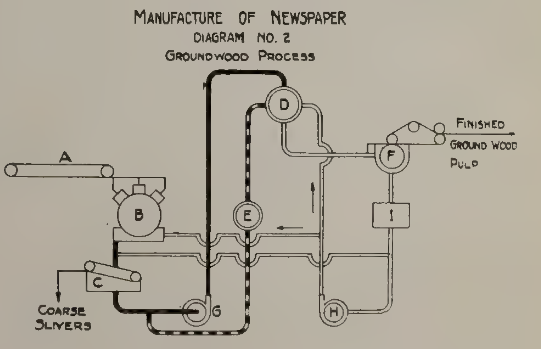
The steam plant of the paper mill must be proportioned to take care of the large amount of heat required for ventilating the building. For every pound of paper made, about 2.3 pounds of water are removed from the paper web at the dryers, which is converted into vapor, and must be carried off by the ventilating system.

Considering the temperatures encountered in Canada, the amount of heat required for ventilating a paper machine building may at times be as much as eighty per cent. of the heat needed for drying the paper on the machine; the factors determining this are the temperature and relative humidity of the atmosphere.

Temperature has an appreciable effect on the manufacture of paper; large quantities of water are required in the process, and some of the water has to be raised to suitable temperatures in cold weather.

The water supply has also to be carefully considered in the location of paper mills, since there are employed various chemicals in the making of the paper, and unless the chemical characteristics of the water are given due consideration, there may result a large waste from that source.

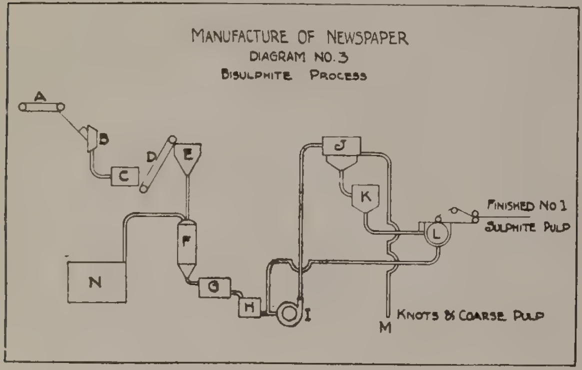


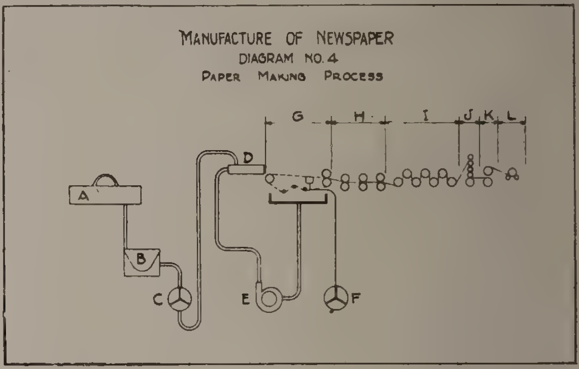


Of the power employed in the news-paper industry 84.4 per cent. is used in ground-wood mills, 8.4 per cent. in paper mills, and 3.2 per cent. in sulphite mills. In the ground-wood mills 86 per cent. of the total power consumed is apllied to grinding the wood, so that out of the total amount of power used in Canada in the manufacture of news-paper and its allied industries, 76 per cent. is used on the grinders.

By referring to photograph No. 1, an idea may be formed of the general arrangement of the pulp grinders of the ordinary type.

Photographs Nos. 2 and 3 show an installation of two automatic grinders. The ordinary grinders are generally arranged in such a way that one man can feed the wood into two machines which produce from six to nine tons each in 24 hours.





Pulp makers have usually believed that the speed at which the grinder operated was of no great consequence and that the determining factor was the pressure with which the wood was forced against the grindstone.

The writer has made numerous experiments, which have shown that with a grindstone running at a surface speed of from 3,200 to 3,500 feet per minute, the pressure may be varied within a large range without having any appreciable affect on the amount of fibre produced as long as the speed is kept reasonably constant. This also is confirmed by other experimenters.

A number of old plants are without speed control, and, as a result, of the fact that the operator who attends to the grinder will not feed regularly, the product necessarily varies considerably. To illustrate this point, reference will be made to the performance of an ordinary grinder which was operated by a hydraulic turbine and to the gate mechanism of which was attached a Bristol Mechanical Recorder. The speed of this turbine was kept constant by a governing device and the movement shown by the recorder represents the gate opening of the turbine which is nearly proportional to the power. The record is for a 24 hours run, and the shifts of operators were made at 7.00 a.m., 3.00 p.m., and 11.00 p.m., respectively. It will be noted that the least efficiency was obtained between 11.00 p.m. and 7.00 a.m., a fact which might be attributed to the work being done at night, but which was in reality due to the inexperience of the operator, who was a new man.

This chart is specially shown with a view to calling attention to the manual expertness of operators, and to point out how necessary it is that plants, even of this nature, be kept in operation the whole year in order that the operators may obtain a higher degree of efficiency.

The writer has given preference to automatic grinders, especially when they are electrically driven and in use for part of the day only.

Automatic grinders can be adjusted in such manner that practically no manual attention is necessary, and for this reason, the efficiency of such a machine should be considerably in excess of what can be obtained with the ordinary type of grinder.

By referring to photograph No. 3, which shows the charging end of an automatic grinder, it will be noted that the receptacle over the grinder contains a large quantity of wood and installations have been made where the wood supply in these automatic grinders lasts from 12 to 16 hours. Such machines are specially adapted for use when surplus electrical power is available at any time of the day. Actual operating results have shown that the amount of pulp produced per H.P. hour is from 10 to 20 per cent. in excess of what has been possible with the ordinary type of grinders; and the automatic machines have the further advantage that one skilled operator can supervise a number of them, the duty of the operator being only to see that the mechanism is kept in good working order.

In order to avoid misunderstanding, it should perhaps be stated that such devices for constant power consumption can be and are used on the ordinary grinder, and to repeat that so long as the placing of the wood to be ground depends upon the skill of the operator, the best results cannot be obtained.

Paper read before Canadian Society of Civil Engineers, March 5, 1914.

I. A. STANWOOD DEAD.

Mr. I. Augustus Stanwood, said to be the first man to manufacture paper by the wood pulp process, died on March 4, aged 75. He was born in August, Maine.

Mr. Stanwood entered the paper manufacturing business with his father at an early age. That was when paper was made from rags. The germs carried by the rags caused cholera.

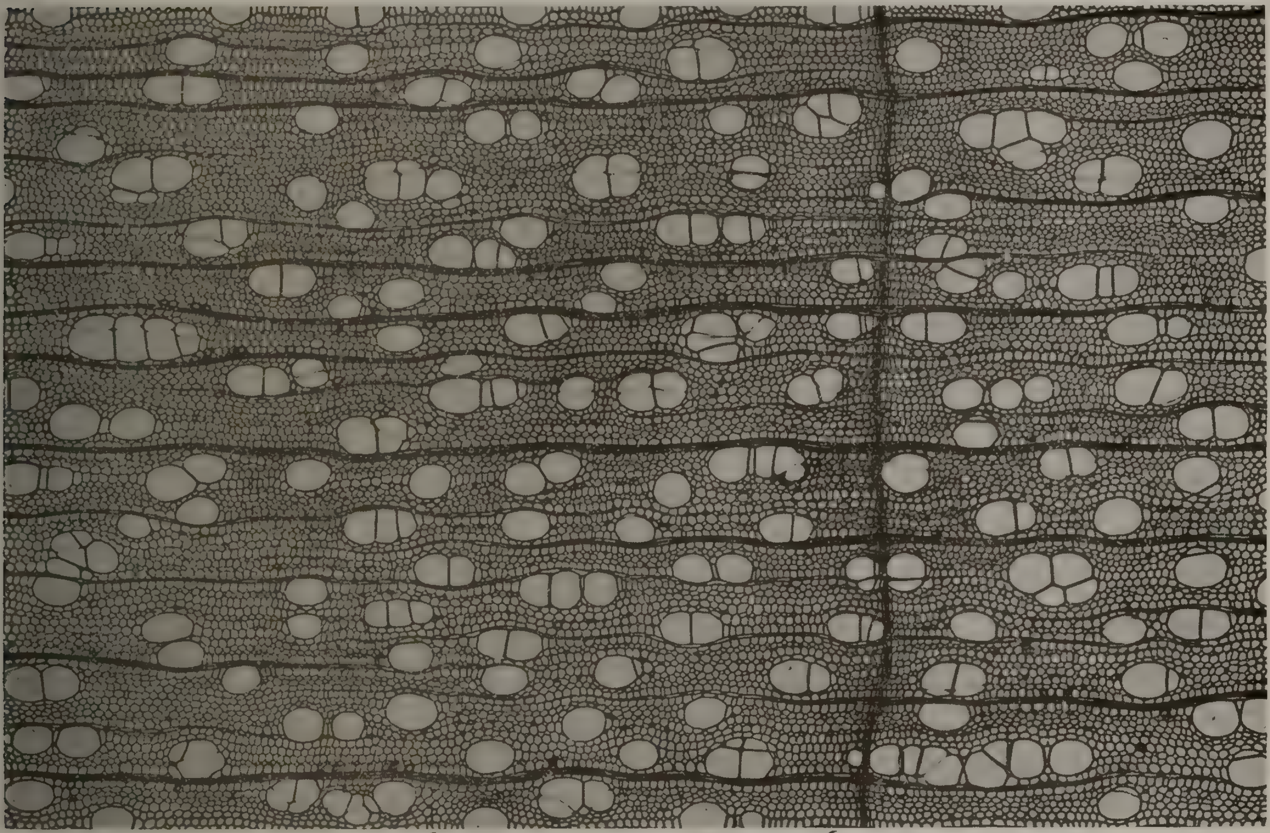
It was to remedy this that Mr. Stanwood started to experiment with wood as material for making paper. In January, 1863, not only had he produced wood paper, but was selling it to the trade.

Mr. Stanwood's attention in the experimental stages was called to the material used by hornets in making their nests, and its close resemblance to paper.

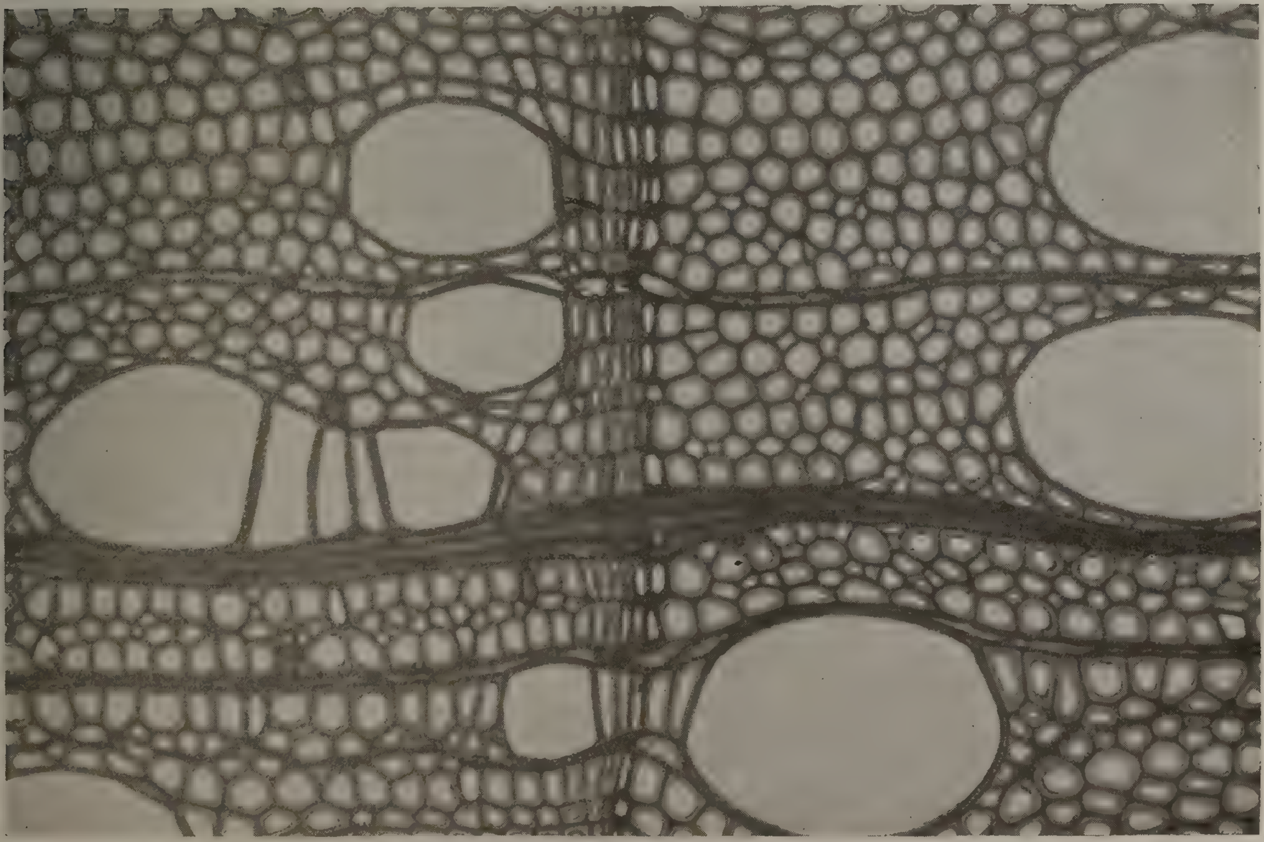
Micro. Photographs of Paper Making Woods--WHITE BIRCH

Made under the direction of H. D. TIEMANS, U.S. Forest Products Laboratory, Madison, Wis.

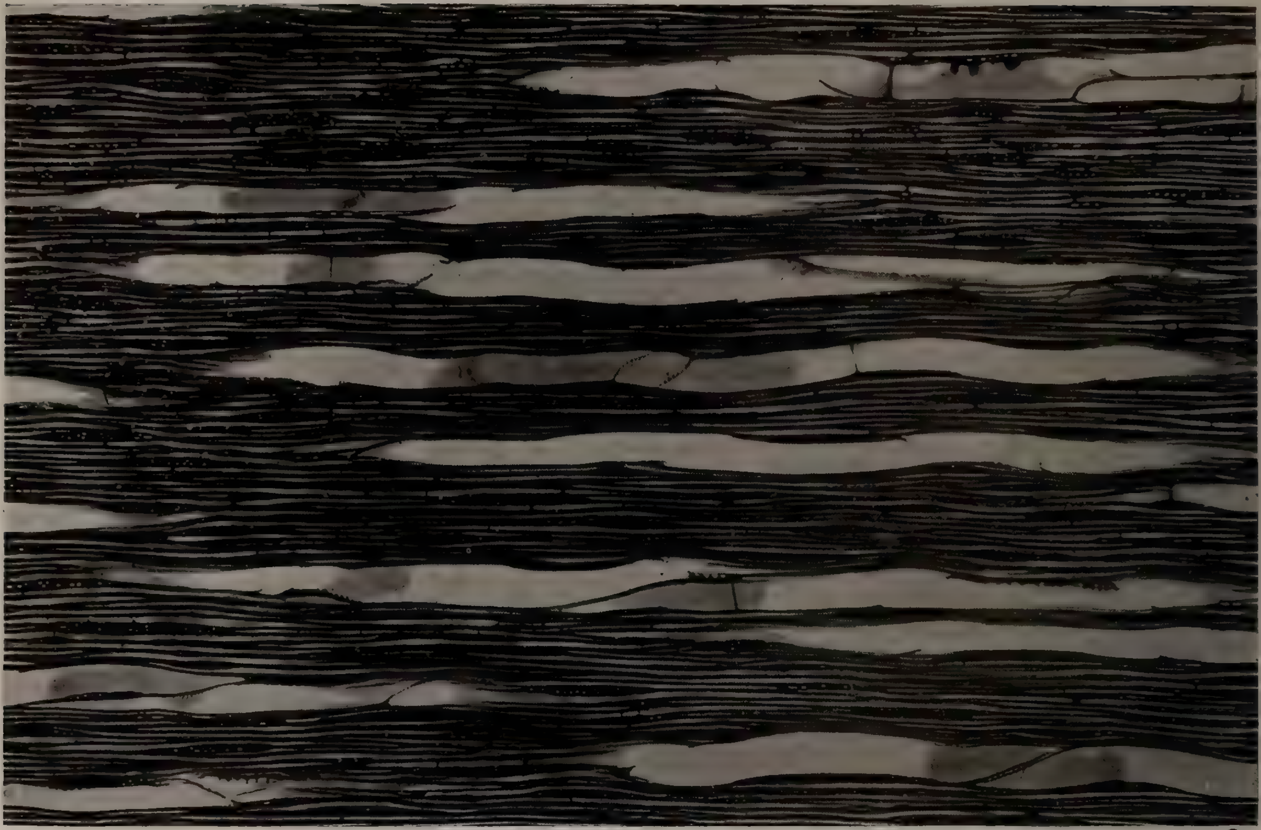
(Concluded from February 15 issue)



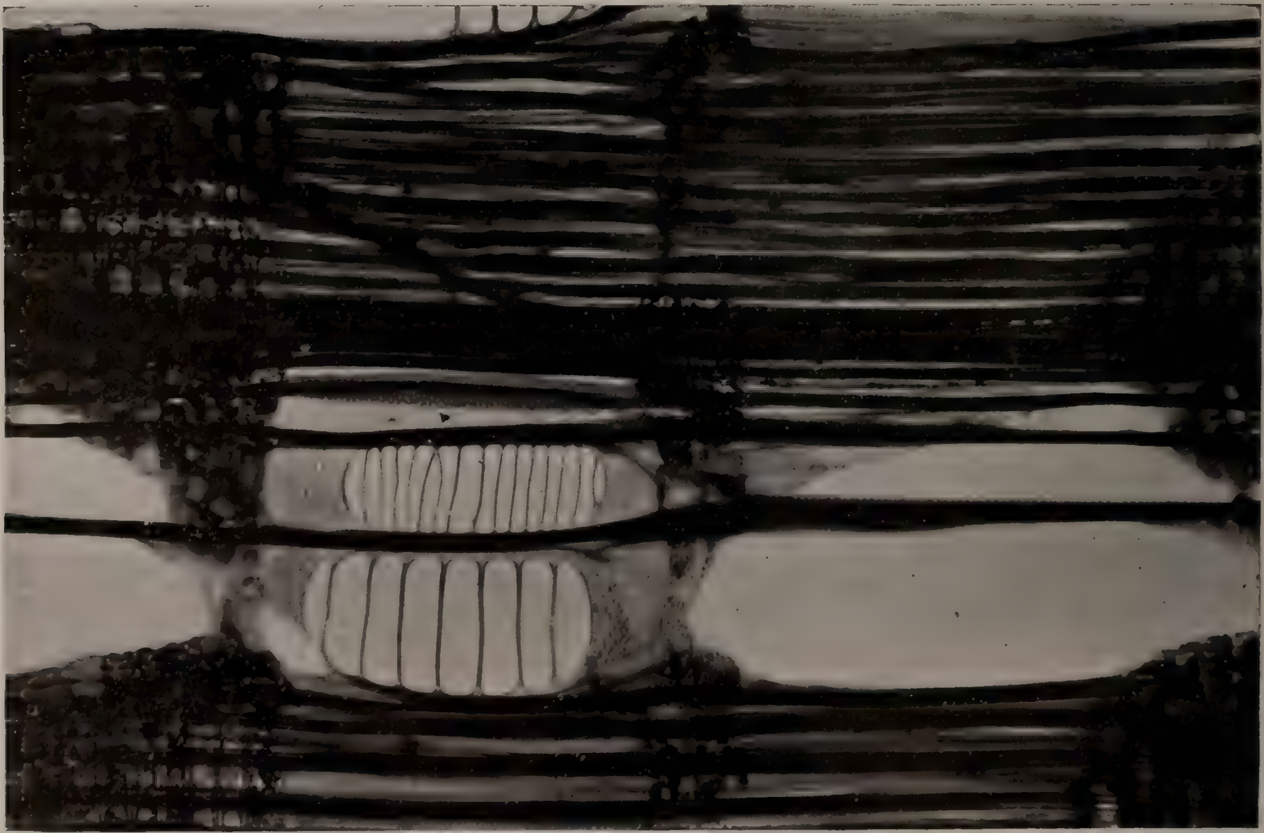
Betula Papyrifera—White Birch—Transverse × 50.



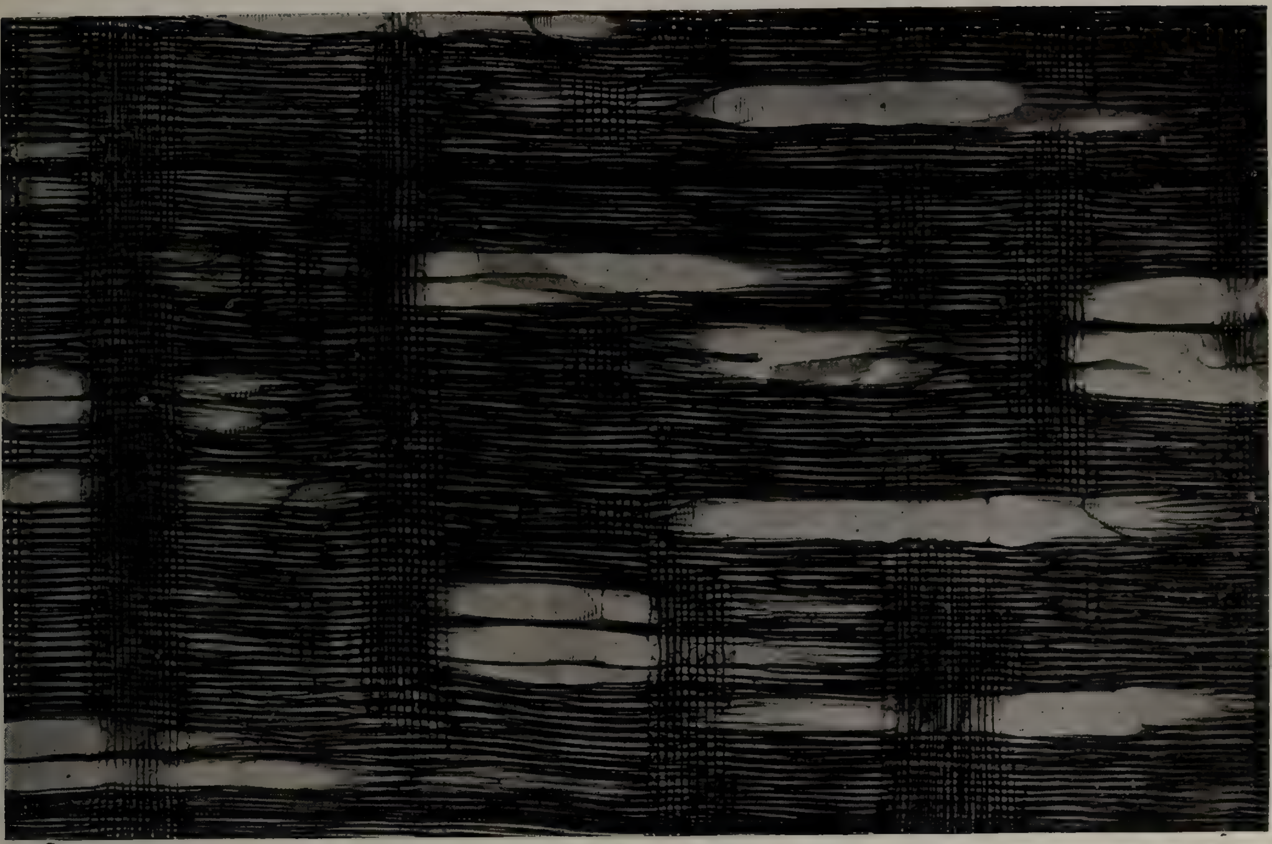
Betula Nigra—White Birch—Transverse × 250.



Betula Papyrifera—White Birch—Tangential × 50.



Betula Nigra—White Birch—Radial × 250.



Betula Papyrifera—White Birch—Radial × 50.

VACATION EMPLOYMENT FOR STUDENTS.

It is now nearing the time of year when college students, actuated either by solely ambitious reasons or from motives which may be ascribed as partly ambitious and partly born of dire necessity, begin to cast about for some profitable employment during the long vacation.

The custom is not so general now as it used to be for under-graduates of universities to seek work as waiters at fashionable summer resorts. The romance of the thing has worn down a bit and the associations could not have been altogether pleasant, for life in the servants' quarters of a busy hotel has little of the boating-tennis feature about it.

Now a new and a more profitable way of helping out between courses is beginning to present itself to industrious young college men. Large manufacturing concerns that employ chemists, engineers, draughtsmen and such like professional help, in many instances offer opportunities to the student to employ their spare time, if not profitably in a financial sense, at least to advantage, worth more in the end than wages.

We have before us a copy of a letter from the Republic Bag & Paper Company, addressed to Professor Ralph McKee, in charge of the pulp and paper department of the University of Maine. Professor McKee, it will be remembered, delivered an instructive address before the American Paper and Pulp Association on the training of young men for the manufacture of pulp and paper, in which he made an appeal to the paper manufacturers to provide more complete equipment for the institution which had undertaken the instruction of young men in practical and theoretical paper making. The company is commending the efforts of the University of Maine, and particularly of Professor McKee, in the cause of a technical training for paper makers, offers to assist the institution in a practical way by finding employment for one or two students during the summer vacations, or from June 15 to September 1 each year, at a salary of $50 per month. The promise is made with the understanding that the company is to have an option on the students' services for the first five years after graduation. The idea is to provide competent superintendents, and it is understood that if the student proves his ability he will quickly be advanced to this responsible post.

This is an example of what may be termed practical generosity, meant to benefit alike the university, the students and the manufacturing employer.

No doubt the example so set will be followed by similar offers, and practical training at the mills will become a regular feature of the college course, so that while the student will be gathering knowledge in return for services, he will also be earning enough to support himself during the summer months. In response to an inquiry we are informed by Mr. J. L. Wilson, of the engineering department of the General Electric Company, that it has been the custom of the company to employ one or two college students on construction work during vacation season, and usually to pay them $10 per week or more, according to ability.

This is naturally as it should be for the benefit of all concerned, and we trust to see the practice become general among the paper mills within the near future.—Paper Trade Journal..

ELECTRIC DRIVE IN PULP AND PAPER MILLS

By **W. L. MERRILL.**

P. & M. Engineering Department, General Electric Company.

In discussing the question of electric power in pulp and paper mills, it is unnecessary to go into the advantages of electric drive over other methods. The fact that the paper industry is, I believe, second (textile first) among our major industries to recognize its advantages on what might be termed a wholesale basis would seem to prove this. It has been building new mills and re-equipping old ones with electric drive ever since. An estimate of the amount of electric power used in the United States in this industry is probably in excess of 200,000 h.p.

The developmental history of the electrification of paper mills is essentially the same as in the other major industries. That is, the first few installations which were made were simply replacing some of the main drives by single motors, using the group drive system throughout; that of course giving a small number of motors of comparatively large capacity. This method was also followed in the building of the first new mills electrically driven. Gradually, as the flexibility and convenience of the drive was recognized, the group system to an extent became eliminated and special drives were gotten out for individual machines, such as jordans ,beaters, and the like, until at the present time in a new installation most of the machinery has its individual motors.

The machinery manufacturers for this industry have in the past been somewhat slower to take advantage of a combined motor and machine design than in some of the other industries; preferring to supply the old standard lines, leaving the application of the motor drive to be made as best it could. This condition is now somewhat changed, and a number of combined machines are on the market. Still there are many more machines yet to be studied by the machinery and electrical manufacturers with a view to bringing out a more efficient combined unit than a combination of the two existing standards.

To digress a little, who would have dared predict fifteen or eighteen years ago that it would be possible to buy in the open market, combination stock machine tools? Such, however, is the case and it is now possible to purchase machine tools from the largest planers with a one hundred horse-power reversing main motor drive with several auxiliary motor drives without a single belt, down to a $\frac{1}{4}$ horse-power motor-driven emery wheel. In many cases the tool and motor are designed for each other, and all common parts eliminated, the motor forming a part of the tool or vice versa.

Drive.

In dealing with the subject of drives, I shall try to point out some of the methods and the advantageous ways of grouping the drives which experience has shown to give the best results.

No hard and fast rules can be laid down by any engineer as to whether individual or group drive, the selection of frequency, voltage, etc., can be followed, but each case must be treated on its own merits. This naturally divides itself into two distinct classes: namely, the electrification of an existing mill and the electrification of a new mill.

The New Mill.

In general, the drives for a new mill will naturally be along the lines of individual drive, the saving in first cost of belts, shafting, hangers, etc., more favorable location of the machinery and safety of employees will go a long way to offset the increased cost of the larger number of smaller motors. Parts of the mill where this is questionable, or at least should be carefully analyzed, are the wood room, rag room, cutter room, etc. I predict that in the near future individual drive will be universally used, even for these, as good examples are now available even in some of these departments.

The Old Mill.

In the electrification of existing machinery, the results do not always warrant the cost, and group drive is still and should be used, since the changes in the mill machinery itself for the adapting of individual drive are often expensive. This is particularly true in the case of centrifugal pumps. However, when extensive changes are being made in a mill where pumps of many years' service are installed it is often more economical to scrap these and purchase modern high efficiency pumps individually driven by their own motors. This is a question of investigation in each case.

Choice of Current.

There is, with the exception of one or two cases, no excuse for installing direct current in a paper mill, unless of course it is merely a matter of a small extension to an existing plant. The particular nature of the loads and the continuous service, and in most cases constant speed, lead to the adoption of alternating current. While direct current installations may prove in a measure satisfactory, I have yet to see any arguments or conditions which would warrant direct current installations on a wholesale basis. The cases where direct current should be used I consider are limited to the following:

In case of driving the paper machines by motors, it becomes necessary to use direct current, if any large amount of speed variation is desired. There are also some advantages in using direct current in a finishing plant where practically all of the load is super-calenders. A single direct current motor is somewhat simpler than a two motor a-c. drive, but even here, if the cost of the power plant is to be considered, it will probably be found in favor of the a-c. when the present or ultimate requirements exceed 500 kw.

Grinder Drives.

Perhaps one of the most recent developments which is attracting attention at the present time is the electrically-driven grinder. Until a comparatively few years ago it had usually been supposed that the only economical way to grind wood was by water power direct. Certain factors have now entered into this operation which make it not only feasible but desirable to drive grinders by motors under certain conditions; first, it allows the development of several water powers in close proximity to the mill to be electrically developed and used in one place; second, there are a great many power companies throughout the country who are desirous of obtaining contracts for large blocks of power during certain hours of the day and many times continuous throughout the day at such attractive rates that it not only becomes a feasible but a paying investment to install motor-driven grinder equipments. For example, assuming a mill in which all the ground wood is used for making paper, the normal method used to be to run all of the stock over wet machines, using laps either directly in the beaters or storing them for future use. This usually necessitated an installation of grinders in excess of the normal demand of the paper machines so that pulp could be stored during high water and used during the low water. This, of course, is an added investment and also a labor expense in running the lap machines, handling the pulp to storage, again to the beater room, and last but not least, extra power for beating laps. Now, by the use of the noodle machines and a favorable contract for power, the grinder room can be run at just the capacity to take care of the requirements of the paper machines. And with the installation of a few wet machines it is usually possible to gradually accumulate a moderate supply of lap pulp and sell to the other fellow during low water periods at a good margin of profit. This constant supply of ground wood in the slush form is where the electric drive can be used to advantage in many mills. For example, with assumed conditions as shown in Fig. 1, the demand of the paper mill machinery would require eight grinders running continuously.

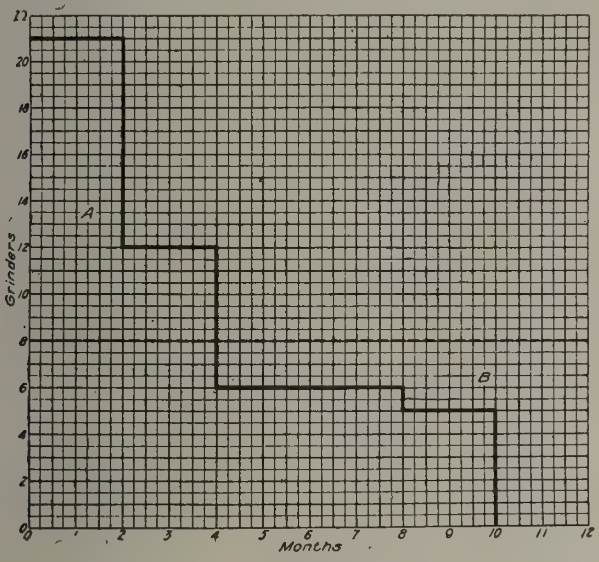


Fig. 1

In such an installation we will assume that there were twenty-one grinders installed and water for the total number in an average year might be available for two months. Two months it would be possible to run twelve grinders; four months of the year, six grinders; two months of the year, two grinders; the remaining two months, none. Under the original process it may easily be seen that the wood ground represented by area (A) has to make up the deficiency for the low water period (B). In this case we have a total of one hundred grinder months during the year.

Assuming 300 h.p. per stone, two 1,200 h.p. motors each driving four stones and purchase power available, the following savings would be realized.

Maintenance on excess grinders, head gates, pen stocks, wheels, etc.; extra power necessary to run at the lap machines, less power and time in the beater room; the cost of one attendant per lap machine; the cost of transporting the pulp to storage, piling it, bringing it back to the beaters; shrinkage and waste due to handling and storage. Against this saving we would have the added investment of the two motors, the power to drive the deckers (which is negligible) and centrifugal stock pumps.

Second example: Assume a stream flow as shown by Fig. 2, eighteen grinders two months, twelve grinders two months, six grinders five months, four grinders three months, making a total of 102 grinder months. Under this condition one 1,200 h.p. motor driving four grinders, in addition to the four grinders which can be run all of the year by water power direct, would give an even flow of stock for the machine room, with practically the same savings as noted before.

In either of the above curves it will be possible at slight expense as far as power is concerned to materially increase the size of the mill, as one or two of the wheels originally used for driving excess grinders could be equipped with generators and motors applied to the additional machinery. During the low water period, power could be bought in larger quantities from the central station.

Another advantage in electrically-driven grinders and purchased power is the fact that during low water periods the price of pulp is usually much higher than at average high water periods. It might therefore be possible by the installation of a few wet machines, or retaining some of those already installed, to run some of the product during the time of peak prices over the wet machines, shut down one paper machine, and place the pulp on the market instead of using it in the mill.

In the case of large installation of motor-driven grinders, increased production can be obtained by installing one or two smaller motors at a speed, say, of 300 to 325, so that when the stones wear down in the slower speed drive they can be transferred to the higher speed motor and the production again brought up to approximately that of a new stone. This is also feasible in the case of a water power installation where there are several stones on a shaft, usually of varying diameters, the smaller stones can be taken out and replaced by full sized stones, the smaller ones being transferred to a motor of higher speed for this service. In the original grinder installations there seems to be a great deal of trouble incurred by the insistence of the operators in slowing down the stones for sharpening. I believe it is now practically universal to sharpen the stones at

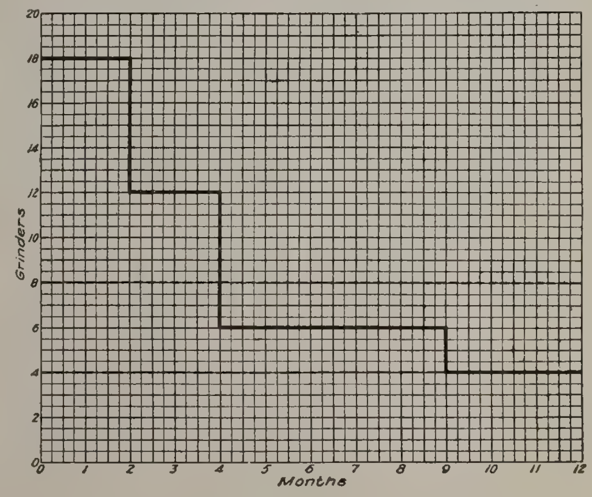


Fig. 2

full speed. There is one precaution that should be taken in a motor-driven grinder installation; that is, in arranging to turn for balancing the stone before it is placed in service as, if no arrangements are made in the electric equipment for slowing down for this process, a stone out of balance brought up to motor speed might give serious results. The lathe for doing this work, however, is inexpensive.

Power Requirements for Paper Machines.

It is not the purpose of this paper to discuss the amount of power necessary to drive paper machinery, but I have data for power to drive paper machines which may be of some value in approximately estimating the power necessary to drive various machines and is taken from very accurate and authentic tests of about thirty machines on various classes of stock and running at various speeds.

An analysis of the test tabulated shows that in most of the Fourdrinier and single cylinder machines the power required to operate the entire machine (including both constant and variable speed ends) is in the neighborhood of 0.004 to 0.0045 horse-power, per inch width, for each foot of speed of the paper. While it is theoretically incorrect to express the power required in this way because the total power taken by any machine is made up of two components, one (that for the constant speed end) being practically constant for all speeds, and the other (variable speed end) being about in proportion to the speed, nevertheless it appears from the test results that the formula, h.p.= 0.004 to 0.0045 + width in in. × speed in ft. per min., give a fairly good check on the power requirements of a machine, the result when applied to a variable speed machine being possibly a little lower at the low speeds, and a little higher than the actual power at the high speeds.

The power required for the variable speed end alone runs from about 0.0023 to about 0.003 h.p. per inch width, per foot per minute speed.

For multi-cylinder board machines, the power is very much higher, ranging from 0.012 to 0.015 h.p. per inch per foot per minute for the entire machine, and from 0.0069 to 0.0088 h.p. per inch per foot per minute for the variable speed end alone. These figures, as previously mentioned, are in actual brake horse-power, and should be increased by about 10 per cent when comparing with tests of indicated horse-power.

This data is based on machines after they have been in service long enough to be worked down and in normal condition.

Electric Drive for Paper Machines.

A number of methods have been employed with success as follows:

(1) Constant speed motor driving both constant and variable speed ends of machine, with mechanical speed changer between motor and variable speed shaft. This is the cheapest installation, as far as electrical equipment is concerned, but does not eliminate the speed changes which, especially in the case of large machines, may prove troublesome, besides having a first cost that may entirely offset the initial saving in the electrical equipment.

(2) Constant speed motor driving both constant and variable speed ends of machine. Speed variation obtained by changing pulleys driving variable shaft. This gives the lowest total cost, but does not give any fine speed adjustment, and requires considerable time to change pulleys. It should be used only in cases where it is expected to run on one grade of paper for long periods. It has been used in connection with new machines, which are usually operated at lower speed during the first few weeks or months of operation, than after they have been "broken in."

(3) Constant speed motor driving constant speed end and slip ring induction motor with regulating resistance driving variable speed end. This method is only applicable when the amount of speed variation is very small on the variable speed end on account of the poor speed regulation at lower speeds. Just what variation is practicable has not been definitely demonstrated and probably varies with different grades of paper, but I do know that such installations have proven unsuccessful and trouble has occurred with a speed variation, 20 per cent in the case of tissue paper machines; but in cases where this drive is used I would not recommend that an attempt be made to reduce the speed much other 10 per cent.

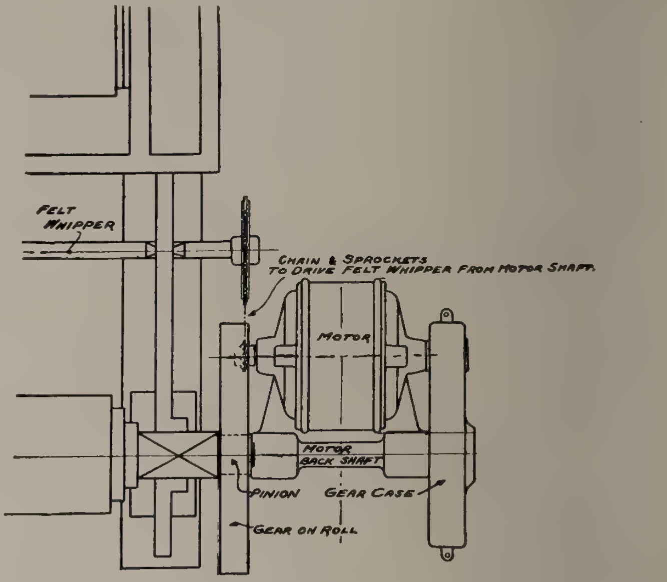


Fig. 3

(4) Constant speed motor on constant end; adjustable speed direct current motor, field control on variable speed end. Since most paper mills use alternating current for their principal drives, this scheme requires a motor generator set for supplying the necessary direct current for the adjustable speed motors. The range for which it is economically possible to obtain adjustable speed motors. This limiting range is about four to one, and it is preferable to confine it to three to one. While it would be possible to build motors with a larger range, their cost and operating characteristics would not be favorable. It is sometimes possible to combine an adjustable speed motor with one or two pulley changes, and obtain a higher range economically. For example, if a machine ordinarily operates between 75 and 200 feet per minute, but on rare occasions is required to run at 40 or 50 feet, it might prove most economical to install a 3 to 1 motor with an extra pulley, all ordinary speeds being taken care of by field control, and the extremely low speeds by using the smaller pulley. Installations of this type have been made, in which two pulleys were mounted permanently, side by side, on the motor shaft with corresponding pulleys on the back shaft of machine. The change of the belt from one set of pulleys to the other can be made in a comparatively short time when a speed is desired

which cannot be obtained with the particular pulley ratio in use. This scheme requires the use of a three-bearing motor.

(5) Constant speed motor on constant end; speed variation of motor driving variable speed end being obtained by voltage control. This is the system commonly known as Ward Leonard control. It requires a separate generator for each machine as well as an exciter fo exciting the fields of both the generator and motor, but is the only practicable scheme (except a modified form which will be described later), for obtaining speed ranges of 5 or 6 to 1 and greater, by purely electrical means, i.e., without the use of auxiliary mechanical devices, such as the step pulleys, etc. The generator for supplying direct current for the variable speed motor is usually driven by an induction motor. If several machines are involved, it would be possible to combine the generators in one set with a common driving motor and exciter for all, or at least for two of them. It is also possible to omit the motor, driving the constant speed end of the paper machine, and drive this from a pulley on the motor generator set, making the motor of this set large enough to drive both the constant speed end and the generator supplying the power for the motor driving the variable end.

(6) Another arrangement consists of an engine of sufficient capacity to drive the constant speed end of the machine direct or by pulley, and direct connected to a direct current generator on the other side of the engine. The variable speed end is then driven by a motor receiving its power from the generator by the Ward Leonard system. This seems to me to be a very economical and applicable drive.

(7) Still another combination which has been used with success is the driving of a generator by a non-condensing turbine or engine, driving the variable speed end by direct current motor and the constant speed end by a constant speed motor.

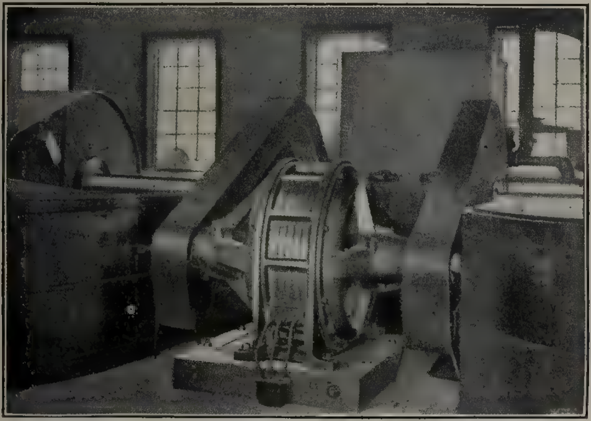


Fig. 4

150 H.P. Induction Motor Driving Two Beaters through silent Chains

In any system of motor generator control where speed variations of more than, say 4 to 1 are considered, they are best arranged by having a certain amount of speed control within the motor itself. Since the torque curve of the variable speed end of a machine deviates somewhat from the constant torque line, taking more power per revolution at low speeds and less power per revolution at high speeds, the current necessary between the motor and the generator is more at low speeds than at high speeds. The ventilation of the motor, of course, is less at low speeds. By a combination of the Ward Leonard system and field control of the motor, lower first cost equipments can be installed and give better operating characteristics.

Sectional Drive of Paper Machines.

Sectional drive of paper machines is perfectly possible and feasible. Some experimental installations have been made with more or less success. I believe, however, that the time is not ripe for the wholesale adoption of this method of drive and that we are at the present time in this respect about where we were ten of fifteen years ago in the electrification of the whole mill, i.e., group drive. As the mechanical and electrical arts progress, eventually sectional drive will become the standard, although it may be ten or it may be twenty years.

Appendix.

Different types of motors have been developed for various service conditions and each type has its distinctive field. Alternating current motors are generally divided into the following classes:

A. Squirrel cage.
B. Internal resistance type.
C. Collector ring type with external resistance.
D. Synchronous motors.

A—Squirrel Cage Type or Motor.

The squirrel cage type of motor is essentially a constant speed motor and the speed cannot be appreciably changed. This type of motor has high starting torque, high efficiency, and high power-factor. In the larger sizes it is customary to use compensators for reducing the voltage applied to the motor at the time of starting. This is not to protect the motor but to avoid heavy fluctuations on the line. It will, therefore, be seen that squirrel cage motors should not be used; first, where speed reduction is required; second, where at the time of starting it is desired to start slowly or to ''jog'' the load; third, where sudden shocks are objectionable at the time of starting, such as in the chain drive on beaters. In group drives where belts are used, these shocks are absorbed by the belts and are not objectionable.

B—Internal Resistance Motors.

The internal resistance motor has high starting torque, high efficiency, and high power-factor, similar to the squirrel cage and has the advantage of being able to gradually increase the speed of the motor until the machinery comes up to speed and is satisfactory for service where the load has small inertia or is practically all friction and the time of acceleration does not exceed about one minute. The internal resistance, however, cannot be made large enough to give any speed regulation and the motor must be treated as a constant speed machine. This motor is satisfactory for group drives of average service conditions, such as screen rooms, sulphite departments, etc.

C—Collector Ring Type of Motor.

The collector ring type of motor has a high torque, high power-factor, and efficiency somewhat lower than the above two types. It may be either constant speed or varying speed. As a constant speed motor it should be used where heavy starting duty is required, since it is possible to proportion the external resistances used in connection with a drum controller to meet almost

TYPES OF MOTORS (SEE APPENDIX)

A—Squirrel Cage; B—Internal Resistance; C—Collector Ring; D—Synchronous.

Machine	Type of Motor for Individual Drive	Connections	Remarks
Grinder lines	C or D	Direct connect through flexible coupling	In case of single stone a higher speed motor may be used with rope drive
Flat bed screens			Groups of several lines use B or C or D. Individual line use A with gear or chain
Rotary screens			Little power required—can be arranged for individual drive
Centrifugal screens	A	Belt to pulley on top or pulley on bevel gear shaft	Can be arranged for direct connection to vertical motor or to horizontal motor through the bevel gear
Sliver screens	A	Belt or gear	When group driven they are usually connected to a main group of machines
Circular saws	A, B or C	Belt	
Band saws	C (with enclosed collector rings)	Direct connect through flexible coupling	
Small conveyors	C	One belt in the reduction (for mechanical protection)	Belt can slip in case of clogging. Starting resistance should be liberal for slow starting and breaking loose
Heavy conveyors and log hauls	C	Same as for small conveyors	Same as for small conveyors
Chippers	C	Belt	A combination design is feasible for direct connection
Barkers	A	Direct connected	
Jordans, Marshalls and Claflins	A, B, C or D	Direct connected through flexible coupling—sliding motor or telescoping coupling	New type Marshall has adjustable shell. Drive through solid coupling or flexible coupling
Beaters and washers	C (see Fig. 3)	Chain or belt	Usually driven in pairs from one motor (see Fig. 3). Chain should be amply large. With belt drive, motor may be in basement. Liberal starting resistance needed in any case
Wet machines	C	Gear	Fig. 3 shows suggested arrangement with chain drive to whipper from motor shaft. C used to give slow speed for adjusting felt
Deckers		Belt	Group drive by A or B on account of low power and speed
Super calenders	Direct current special or alt. cur. small motor A Large motor C	Gear Gear and clutch	Direct current motor has field and shunted armature control
Sheet calenders	C	Gear	Group drive usual on account of uniform speed. Individual drive has operating advantages
Platers	A		Combination individual drive now available
Pumps	A or B	Solid coupling direct connected	
Agitators	A or B	Belts and gears	Slow speed and small power. Usually driven from some other group of machines
Shredders	A or C	Belted or direct con'ted	A or C motors according to size. A motors should have high torque rotors. C motors with ample starting resistance
Rag cutters, dusters, and threshers	A	Belt or gear	A motor is preferable for individual or group drive where power conditions permit, on account of amount of dust
Rotary boilers	A	Gears	
Rotary furnaces	A	Gears or gears and belt	
Rotary cutters	A with mechanical speed change or adjustable d-c.		Many of these machines can be purchased equipped with motors
Vertical cutters	A	Gear or belt	Many types on market ready equipped with motors

any condition of starting required. With liberal resistance grids, several successive starts can be made without injury to the motor or controlling appliances, such as breaking a wood conveyor loose when jammed with ice or for starting beaters after the stock has settled. A squirrel cage motor under similar conditions might injure the conveyor or jump the roll out of its bearings. As a varying speed motor it can be used where a certain amount of speed regulation is required, provided it is not objectionable to have the speed change as the load changes; e.g., cranes, hoists, etc. It is not applicable to drives where constant speed is desired at different loads with one setting of the controller. As the load decreases, the speed increases, and vice versa.

D—Synchronous Motors.

Synchronous motors have low starting torque as compared with the above types, high efficiency, and an adjustable power-factor and can be often used advantageously for improving the power-factor of the system. Before installing a synchronous motor, however, conditions of operation should be thoroughly studied as many times the case of low power-factor is due to many motors on the system running at partial loads.

Synchronous motors should not be installed on line shafting or individual machines where a heavy starting torque is necessary, unless they are provided with clutches or some means of relieving the load at the time of starting. The starting torque, in general, is limited to about 30 per cent full load running torque. The synchronous motor can be used to advantage to supply auxiliary power to a line shaft already driven by a waterwheel or an engine, power being obtained from another station..

The synchronous motor also has a field in the industry in connection with low pressure turbines. Where there are one or two reciprocating engines, it is often advantageous to install a low pressure turbine and supply power to various motors throughout the mill; also to "pump back" on the engine or main line shafting with the synchronous motor. A combination of the engine or turbine and the synchronous motor is self-regulating.

Drives in General.

It is undoubtedly needless to call attention to the desirability of having all transmitting parts, such as belts, rope drives, gears and chains of ample proportion throughout the mill. Large motors which are to run continuously on heavy work with belting under severe conditions should be equipped with three bearings; while two bearing motors under these conditions have in many cases proven successful, yet the occasional renewal of the bearing linings more than warrants the added expense of the three bearing installation.

Silent Chains.

Silent chain drives particularly should be chosen of liberal size for the work they are to do. This is true of beaters where continued sudden shocks are apt to come on the chain.—Read before American Paper and Pulp Association.

Brompton Adds News Mill

The Brompton Pulp and Paper Co., East Angus, Que., has decided to go into newsprint manufacture, and on Wednesday placed an order for a new Harne Fourdrinier, 160 inches wide. The machine will have a 75-foot wire and will be equipped, it is said with a Marx Margaet Suction roll, and granite press rolls. They have also placed orders with J. A. DeCew, of Montreal, for a full equipment of Marx double beaters—a lava stone roll and a steel roll.

J. A. BOTHWELL,
Brompton Pulp & Paper Company.

The new machine room will be built just at the end of the present beater room and kraft machine room, and will provide for the addition of a second machine.

Mr. J. A. Bothwell is to be congratulated on the changes he has made in the old plant of the Royal Paper Mills. Practically the entire plant, except the soda mill have been entirely rebuilt since he took charge. In addition to this he has built a mill up the river—one of the finest and most efficient ground wood mills in Canada. Mr. C. A. Ring, the engineer, has designed all the additions and new developments.

The Brompton Pulp and Paper Co. have two ground wood mills, one at Brompton and one at East Angus, Que. The depression in the ground wood market has led them to install the news machine, and sell paper instead of pulp. It would be far better for this country if, instead of rushing to build too many new mills, we converted some of our pulp mills into paper mills. The Brompton kraft paper has long been famous, and with the use of the double beaters there is no doubt they will manufacture one of the best news sheets in Canada.

Brompton Pulp & Paper Co., East Angus, Que.—Machine Room.

HOWARD SMITH PAPER CO. TO CHANGE NAME.

The Howard Smith Paper Company, Ltd., has given notice that it has obtained letters patent authorizing it to change its name to the Paper Industries Company, Ltd.

W. C. E. Koch, who is a well known lumberman and pulp wood operator in British Columbia, has built a big flume on Robson Creek, which will take six million feet of logs down the Slocum river this spring. The problem of getting timber from hitherto inaccessible sections of the mountains will thus be solved.

The Relation of Inventions and Patent Laws to Our Industrial Progress

By J. A. DeCEW, Chemical Engineer, Montreal, Que.

During the past few years there have been agitations, discussions and criticisms in the U. S. in connection with the Patent Laws and their influence in the development or control in industrial life.

It is not with the idea of offering a solution to any of the problems connected with patent rights that the following is submitted, but the relationship of Canadian Patents to our industries is one which we should find of interest and perhaps many of the facts relating to Canadian conditions, are not generally known.

When the investigator in some special field has at last arrived at an improvement, either in method or product, which is valuable to the world, he is offered, in consideration for the knowledge which he reveals to the public, a limited monoply or right, to the idea or product, for a definite period of years, but in some countries there are conditions or restrictions definitely laid down in each case.

Were it not for the protection a patent gives, there would be a small inducement for any skilled artisan to spend time, thought and money in improving an art, but if such improvement were made, he would keep his knowledge a secret as long as possible.

In the history of the industrial life of various countries, this has been shown to be the case and those countries which provided none, or insufficient protection for intellectual property, were unable to make any improvements in manufacturing industries.

The status of the progress of the manufactures in a country may be judged by the proportion of protection of good faith this country offers to the inventive faculties of the artisan.

Wonderful industrial developments in Germany and the U. S. has been attributed directly to their excellent patent systems which, although perhaps far from perfect, are still greatly in advance of other countries.

In a country like Canada which has an abundance of raw material for manufacturing purposes and only lacks capital and proper methds of exploitation to create the wealth which potentially exists, there are great possibilities for further developments, if the right conditions are available. In many respects our industries are limited to the market, which we are able to provide by population, but given an excess of raw material and the best known methods of production, there is no limit to the market which is obtainable.

The paper trade is a special case of this kind, wherein the latest methods, combined with the most valuable material of the best quality, have resulted in an enormous export trade, and a great wealth producing industry.

In order, however, that Canada may keep to the front, and that she may develop improved methods of production simultaneously with other countries, it is desirable, that the best and newest ideas in any line should be introduced into our industrial methods as soon as possible.

In order to obtain this, it is necessary that inventors in whatever foreign country they may live and develop their ideas, should be induced to take our patents in Canada and spend the time and effort, in introducing same to bring them to public attention.

Unfortunately for our general advantage many inventors do not take Canadian Patents and many who do, allow them to become invalid at the end of two years. This is because they must manufacture in Canada within two years or register under the compulsory license Clause No. 44, which greatly restricts the value of the Patent.

Our laws are doubtless framed with the best intentions on the part of our Legislatures and are conceived to be in the best interest of the country, but matters such as this do not always work out in the way intended. If an invention is of considerable importance, it would be several years before the inventor could establish it successfully in his own country, for the greater the advance in the art, the more opposition may come to his improvement from vested interests. The inertia to be overcome requires considerable money and energy before the new idea can be established and unless the inventor happens to live in Canada it cannot be expected that he will be able to concentrate attention upon our market until after he has obtained success elsewhere.

We tell him, however, that he must establish his industry in Canada almost simultaneously with that of his own country. If, however, he should attempt to do this he would in the majority of cases merely court financial ruin. On the other hand we offer him conditions which take away part of his right and force him into a compulsory license system which means that after his business is established, he may be obliged to surrender same to competitors that may spring up. The result to-day is that those inventors who are the wealthiest and have the most experience in protecting and exploiting their inventions have about concluded that Canadian Patents are not worth while.

It might seem that the exploitation in a neighboring country like the U.S. of a patent which is not protected in Canada, would result in indirect benefit to our manufacturers, who would be entitled to use the ideas without cost to themselves. This, however, is an illusion which seldom developes into reality. The result is that a domestic industry based on this patentable idea will not be established until many years subsequent to the invention and then it is no longer novel, for without the assistance and knowledge of the inventor, very little progress can be made in perfecting his idea.

A point of view which is not fully grasped by the public is that any invention to succeed must supply a want and enrich the public at the same time as the inventor. In the majority of cases the benefits to the public are in direct proportion to the benefits derived by those who originate and exploit the idea.

There are instances and conditions existing to-day of the following kind:

A foreign inventor who has proven that he has a valuable idea in the form of machinery or otherwise, is approached by the Canadian Manufacturer who can at once see the possibilities of selling this improvement in Canada. He learns however, that no Canadian patent has been taken or if one has, it has been allowed to lapse on account of non-exploitation within the limited period allowed. The inventor thus having no right in the matter is not inclined to give up his experience or information because he can still export his product to Canada. If he were willing to do so, the Canadian would have no advantage in establishing the product on the market, while any competitor is in a position to supply the demand after he has created it. His position is practically the same, if the inventor has a Canadian patent under the compulsory license clause.

There is no inducement therefore under such conditions to establish any improvement and old methods are allowed to remain until pressure is brought to bear from advances in the art by foreign manufacturers.

Conditions such as these apply also to process work, in which the writer is particularly interested and we often find that we cannot consider the exploitation of many things which would be of advantage to the country because of the insufficient protection surrounding the Canadian patent.

Moreover, we find that the idea is but very little use to us if it has been patented and allowed to lapse, although it would appear that we could take some advantage of this loss to the inventor. It is strangely true, however, that the inventors' loss is everyones loss, because it takes time and money to establish an idea, just as it does to establish a business, and no individual can afford to establish an idea which does not represent to him some form of property, any more than a manufacturer can establish a business whose trade and goodwill will not represent any asset to him after he has created it.

It should be of special interest to the paper trade that the contract between the Canadian Government and the inventor should be such as would protect him to the fullest extent during the limited time given him so that no improvement of value will be lost to us in our trade developments. Even if an invention does not reach us for five years after it is taken out in Europe, and the Canadian Patent is five years old, if that patent is still a valid one, the idea could be taken up and established, and we would only be five years behind. If the patent, however, had been invalidated because the inventor has nto been able to comply with some arbitrary limitations, the chances are that it will not be introduced into the country for at least fifteen years.

The assumption on the part of the Government in the way our patent laws at present are framed, seems to be that inventions and improvements can exploit themselves or will be exploited without protection.

This fallacy is shown by the attitude of any investor whom you may ask to join you in furthering something which would be an advantage to the public. His first question will be; is there proper patent protection and how much?

When we realize to what an enormous extent our industrial progress depends upon patented improvements, would it not be well to carefully consider, if our country, in its own interest can afford to discourage foreign inventors or confiscate their intellectual property.

PROTECTION FROM FROST.

During severe cold the paper machine room must be heated somewhat even on Sundays, because otherwise the formation of much condensed moisture in the form of drops is unavoidable when starting work again on Mondays. Also, rubber parts on the paper-machine such as deckle-straps, rubber driving-belts, etc., suffer owing to severe frost. Rubber deckle-straps for example when very cold may simply break when starting the wet part. Provision should therefore be made that the machine room remains sufficiently warm during severe cold.

MINIMUM CAR LOADING TO WEST.

(Special to Pulp & Paper Magazine.)

Ottawa, March 12.—As the result of a Railway Commission hearing here last week, shippers and railways in Canada have effected a compromise as regards minimum weights for carload loading of paper and woodpulp consigned to the Northwest. There has been considerable discussion over this matter ever since the Canadian railways announced their intention of advancing the carload minimum—the amount of shipment for which a carload rating may be obtained—from the former figure of 24,000 pounds to 40,000 pounds. This was considered a somewhat startling advance, and accordingly the Canadian Manufacturers' Association filed a complaint with the Railway Commission. The matter came up for hearing last week, and after very little discussion, it was agreed that the minimum should be compromised at 35,000 pounds, and an order was issued by the Commission approving this.

PARCELS POST.

The Post Office Department last week raised the maximum weight for parcels to be accepted in the parcels post to eleven pounds. It had been proposed to limit it to five pounds for three months, but as nothing like the rush of parcels that was expected has developed, it was decided to reach the maximum at once. The paper trade has already benefitted more or less by the use of cardboard containers for various commodities, which are being sent through the parcels post in quantities, one egg container which was recently sent to the Postmaster-General, being long and cylindrical and accommodating the eggs placed end to end lengthwise. So far, Canadian manufacturers have failed to take advantage of their opportunities in this regard, and most of the sample containers submitted to the Post Office Department have been made by United States paper box manufacturers. As the Government is desirous of securing every possible benefit to the Canadian trade ,however, from the parcels post, it is hoped that Canadian firms will take up this matter.

DOMINION WATER POWERS.

The Parliamentary Committee on Forests and Water-Powers held its first meeting here a week ago, and cleared the decks for the work it will do during the year. It was decided to call James White, Deputy Minister of Conservation; Hon. Adam Beck of the Ontario Hydro-Electric Commission; R. H. Campbell, of the Forestry Branch and Sir Richard McBride, premier of British Columbia. These experts will give evidence as to water power questions and the preservation of forest wealth, including the elimination of waste in manufacture into timber, pulp and paper. Mr. William Wright, M.P., for Muskoka, Ont., urged that legislation be framed for the transfer of timber lands to municipalities under certain conditions. He pointed out that settlers frequently obtained lands in Ontario for supposed agricultural purposes, cut and sold the timber or pulpwood with which they were covered, and then left them despoiled. Mr. Wright urged that it would be better to give these municipalities who could take over the task of reforestation and in fifty years would be assured of a new crop.

The Victoria Paper and Twine Co., Toronto, have removed into their new warehouse located at 439-441 Wellington Street West, Toronto.

FORESTRY AND PULP INDUSTRY

Address by Raphael Zon, of the U.S. Forest Service Delivered before the American Paper and Pulp Association, in New York City, on February 19.

The present economic era is witnessing a more rapid change in the uses to which raw materials are put than any other era in history. Especially is this so with respect to wood. In many industries, such as construction and building trades, wood, which not long ago was practically the only material used, is now being crowded out by concrete, steel, clay, iron, and fibrous products. Thus in steam railroad car construction only a few years ago from 3,000 to 26,000 board feet of lumber was used per car; now the wooden car is being replaced by the steel type, and practically no lumber at all is being employed. Likewise in the construction of warehouses, depots, platforms, bridges, trestles, and piers, the railroads are beginning to use more and more cement, brick, gravel, and cinders. For bridge and culvert construction, wood seems to have been abandoned on most of the principal lines. Similarly, there is a growing decrease in the demand for wood in the building trades. This is due to substitutes, especially for flooring, fence posts, shingles, and fences. The decrease in these uses within the past few years has been recorded to range from six to 16 per cent as compared with the same use several years ago.

Whatever the future use of wood may be in the construction and building trades, the use of wood in the pulp and paper industry has been constantly on the increase, and as far as our present knowledge goes, there is no other substitute that will take the place of wood in pulp and paper making. While there are many plants, the fibres of which are as well or better adapted to the manufacture of paper, there is no other plant which is capable of producing cellulose so cheaply and so completely as the tree. No other plant can be grown on such a large scale, nor in such adverse climates nor on such poor, rock soils as our northeastern spruce, hemlock, and balsam which are the chief sources of the pulp and paper industry. Practically all of the substitutes for wood, which have so far been suggested are bulky, producing a short fibre and a small yield. These may possibly become important in paper making when the suitable woods are no longer obtainable. Meanwhile the use of wood in the pulp industry is increasing rapidly at the expense of all other materials. Within the last decade alone, from 1899 to 1909, the use of wood in the manufacture of pulp has increased from two to four million cords annually, an increase of 100 per cent; this use is bound to increase in the future, though probably not at the same rate as in the past. It has been estimated by the Forest Service that by 1950 the amount of wood probably needed each year for the pulp and paper industry will be in the neighborhood of 16,000,000 cords, or approximately four times the present requirement.

This increase has been roughly estimated by decades as follows:—

By 1920—7,000,000 cords, an increase of 75 per cent over the present cut.

By 1930—10,500,000 cords, an increase of 50 per cent over the previous cut.

By 1940—13,125,000 cords, an increase of 25 per cent.

By 1950—16,400,000 cords, an increase of 25 per cent.

Of course all such estimates must be taken with some grains of salt, as it is impossible to tell what the actual demand may be; but, judging from the variety of uses now made of pulp and paper, and the rapid increase in output which has taken place during the last ten years, these estimates are probably sufficiently conservative.

I mention these figures also chiefly to impress upon you the connection that exists between the pulp and paper industry on the one hand and timber production on the other. The future of the pulp industry is closely bound up with the future of the timber supply in this country, especially that of the Northeastern and Lake States. There is still another tie that binds the pulp and paper industry to the production of timber. At the present economic condition prevailing in the country, there is an essential difference between the utilization of the forest for pulp and paper manufacture and its use for lumber. This difference consists in the greater interest of the farmer in the development of the nearby timber resources. Our lumber industry, especially in the past, and often now, is nomadic in its habits. Sawmills on the whole, especially in the Northeast, do not represent such a large investment of money as a pulp and paper plant. The depreciation is distributed over the comparatively short period of years during the logging of some particular tract. After the timber reachable from the one mill site has been cut the mills have often been entirely abandoned; the machinery is then either sold for scrap iron or part of it moved to some other place. There is not, under the present economic conditions, sufficient permanency of interest in developing the timber lands lying near the sawmill, but the sawmill moves to the timber wherever it is found. It is different with the pulp and paper plants. According to the last census, each pulp and paper mill represents an average investment of over half a million dollars. It is located, as a rule, at some advantageous point with an abundant supply of water and is intended to be permanent. It can be made permanent only by having the local forests properly handled. These economic considerations made the pulp and paper manufacturers interested in forestry at a time when forestry as a profession was still in its swaddling clothes.

One of your former presidents, Mr. Hugh Chisholm, was the first to provide for the organization of a forestry department in the International Paper Company. It was, perhaps unfortunate that at the time the pulp and paper manufacturers began to seek advice on forestry matters, the profession of forestry was still so young. Even superficial as this advice might have been, it resulted in bringing about a change in the viewpoint of many holders of timberlands in Maine, New Hampshire, and throughout New England. It is now generally recognized that forest maps and topographic maps showing the location of the timber are a necessary condition for the intelligent handling of the timber tracts of the Northeastern States. The same early recognition of the need of proper methods of handling the timber lands as a permanent source for pulp production led many of the pulp manufacturers to a closer utilization of the timber products. I really do not know of any other wood-using industry that practices such close utilization as the pulp and paper industry. Topwood, including branches, is now being used by some pulp and paper manufacturers, especially in Pennsylvania, in sizes as small as two inches outside bark at the middle of the stick, and the only other competitors for the same kind of material are the acid factories. The use for pulp of waste material left after lumbering has recently been introduced in parts of Pennsylvania. Hemlock tops and broken, defective logs are peeled, cut into 5-foot lengths, piled in the woods, and sold by the cord. From 250,000 to 260,000 cords of slab wood, and other soft mill wastes, are now consumed every year for pulp. In 1908, hemlock formed 41 per cent of the sawmill waste used, and its average value was $4.07 per cord, about two-thirds that of hemlock cordwood in the round. In Wisconsin, sawmills often sell their hemlock slabs to paper mills for from two to three dollars per cord.

Because of the need just discussed of permanent local forests, the pulp manufacturers were the first who made use of trained foresters. They employed with good effect men of high standing in the profession, such as Austin Cary. For the same reason, the pulp companies were the first to be interested in the future supply of timber, and turned their attention to planting the cut-over areas. The Remington-Martin Company, I believe was in the lead of this reforestation policy, having planted in 1905 about 600,000 Norway spruce trees. In 1910 the International Paper Company began its reforestation work with the planting of 650(000 Norway spruce, while a number of other companies have also started large plantations.

These facts again go to show that economic interests of the pulp industry are tied up with the permanent development of the timber supply. Is, however, the supply itself sufficient to meet the enormous demand for pulpwood in the future, and what are likely to be the changes in this gradual adjustment of the demand to the supply?

It has been estimated that the total stand of woods chiefly used for pulp is 130,000,000,000 board feet; of this 50.000,000,000 board feet is spruce, 75,000,000,000 board feet hemlock, and 5,000,000,000 board feet balsam fir. These three species are now being cut for both pulpwood and lumber at a rate that should exhaust the entire stand in about 25 years, not counting the growth of new timber on one hand nor the increasing demand for it on the other.

This discouraging outlook, however, is not so black as it seems. First, some new growth is added on every year. Our wild woods, poorly as they are stocked, burned, and over-cut, are still producing some new wood. Even assuming that the increment on the 130,000,000,000 feet of standing timber is only 1½ per cent, that would mean an annual increment of about 2,000,000,000 feet. or 4,000.000 cords, provided the forest area occupied by this timber is not being actually devastated. Considering, therefore, the entire spruce-bearing land of the Northeast, and the Lake States, there is just enough timber produced every year to maintain the present demand for pulpwood. The pulp industry, however, is not the only one that lays claim on this increment. As a matter of fact, the lumberman still uses nearly three-fourths of the entire cut of spruce, hemlock, and balsam for lumber. Small as this increment is, still, it contributes to the prolongation of the present stand.

The adjustment between the increasing demand for pulp-wood and the decreasing supply of such woods as spruce and poplar which, until recently, were the staple woods used, takes places in the use of new kinds of wood.

The total pulpwood consumption in 1909 was slightly more than in 1907, yet all of the leading woods which composed it showed decreases. The increase was in new woods which were but little used before.

Balsam, which in 1907 had an output of 44,000 cords, in 1909 sprang up to 95,000 cords. Pine with 79,000 cords in 1907 went up to 91,000 in 1909. White fir, which was not even listed in 1907, furnished 57,000 cords in 1909. These woods have not yet assumed very large proportions in production, but their entrance and rapid increase is significant. It shows that they can be used for this purpose. That is one important point. Another point equally important is that they are fairly well distributed for the convenience of the pulp industry and that their supply is large. Balsam may be said to be co-extensive with spruce, and, though less abundant, it will considerably extend the supply in the region where it occurs, for it may be logged and manufactured along with spruce. The pine which is used is undoubtedly of two or three species, including scrub pine of the East, loblolly pine of Virginia, and North Carolina, and jack pine of the Lake States. The supply of pine available for this purpose is large. It occurs in dense stands distributed locally through a very extensive region. Loblolly pine attains size for lumber in forty or fifty years and is widely cut for the purpose. Scrub pine and jack pine are not esteemed for lumber on account of their small size. This makes them all the more available for pulp. White fir is found only in the West. Its contribution to the pulp supply thus far has been limited to the Pacific Coast. The stand of this fir is large in the Northern Rocky Mountains, the Cascades, and the Sierras, and scarcely any of it has been cut. On account of the abundance of other more valuable woods in the West for lumber, there will be little demand on white fir for that purpose. The supply will all be available for pulp.

The bringing of these woods into the field materially adds to the pulp supply. And their introduction leads to this inquiry: Are there not other woods just as available for pulp, the introduction of which would still further extend the available supply? Without any question there are a number of such woods. If we can use jack pine, we can also use lodgepole pine, the fibre of which is known to be good, and the stand of which is enormous. We can also use Engelmann spruce and alpine fir, which occupy nearly the same range as lodgepole pine and white fir in the Rockies and the Cascades and Sierra Mountains. If, as experience shows, we can use white fir, it is reasonable to believe that we may use other firs of the Western States—lowland fir, amabilis fir, and noble fir, which occur in rather great abundance. Other woods might be mentioned, but enough have been cited to show the possibilities in this direction.

How are these hitherto unknown woods to be tested, and how are manufacturers to learn of the qualities? In this connection, we should consider the tests under way at the Forest Products Laboratory at Madison, Wis. The Laboratory is equipped to make tests by the sulphite and soda processes and the work is now going on. The programme includes tests on a semi-commercial scale, in the pulping and paper-making qualities of the woods above mentioned and others, such as long-leaf pine, paper and yellow birch, western hemlock, and Douglas fir. Besides ascertaining the fibre qualities and yield, it is expected to determine the best cooking conditions and the methods of handling the product for each wood. In this way, it is planned to test out four or five woods per year.

The issue of February 14 of the New York Herald is printed in part on paper made from several western firs, which have not been used heretofore for news print paper.

Of especial interest perhaps is balsam fir, which is finding increasingly greater employment as pulpwood. Balsam fir in 1910 constituted about 6 per cent, or 132,362 cords of the total 2,220,000 domestic coniferous woods used in the United States by the pulp industry. The principal objection to the using of large amounts of balsam fir in the ground pulp process is on account of the pitch, which covers the felts and cylinder faces, and thus ruins them. It is admitted by nearly all pulp and paper manufacturers that from 10 to 20 per cent of balsam can be used in ground pulp without lowering the grade of the paper produced. Some go even so far as to claim that the moderate addition of balsam fir, from 20 to 25 per cent, is of advantage in that it makes the pulp free, that is, separates the spruce fibers during the manufacturing process and in this way allows the water to be easily drawn from the sheet. In chemical pulp, because of the acids dissolving the pitch, any amount of balsam can be used, although some claim that paper made from pulp containing a large proportion of balsam lacks strength, snap, and character. The pitch gives most trouble in freshly cut balsam, while in wood soaked in water over one season, the amount is so small that it need not be taken into account. Some of the larger mills claim that after balsam fir has remained in a pond for one year any amount of it can be used.

The complaints against the larger amount of pitch in balsam fir are somewhat strange in view of the fact that the actual resin content of balsam fir is less than that of spruce. Resin in coniferous wood occurs normally in cells, of which the wood is built up as a house is built of bricks, and in the spaces between the cells, known as resin ducts, running vertically and horizontally through the wood. These resin ducts may be seen on cross sections of freshly cut wood as whiter or darker spots marked by exuded droplets of resin. On radial and tangential sections the ducts appear as fine lines or dots of different color. The difference in resin content of the different genera and species of the conifers depends mainly upon the number and size of their resin ducts. Balsam fir is one of the few conifers that lack resin ducts entirely, a thing which serves readily to distinguish it from the spruces and pines. Resin is found in the wood of balsam fir only in the interior of the cells, where it occurs in the form of small droplets. The bark of balsam fir is very rich in resin, but after the former is rossed off the wood should be freer of resin than spruce, which contains resin ducts and resin cells. Therefore the pitch, which according to all reports is the greatest drawback to balsam pulpwood, must either come from the resin in bark left on the surface of the block or else is formed in the process of grinding, in which case it is not of a resinous nature. In either event, the presence of pitch is apparently not due to any property of the wood itself.

There is no doubt that the fiber of balsam fir is weaker, shorter and softer than spruce fiber; therefore the prevailing practice of working balsam fir with spruce in both mechanical and chemical processes ordinarily results in an inferior grade of pulp, if the admixture of balsam is considerable. This is not so perceptible in the sulphite process as in the ground pulp. The wood balsam fir being softer, cuts more easily than spruce wood; therefore, a stone of a sharpness and at a given pressure to produce good strong pulp from spruce makes poor pulp from balsam fir. With dull stones and light pressure a better quality of pulp could probably be made from balsam. Similarly in the case of chemical pulp, better results could most likely be obtained if weaker acids more suitable to the softer nature of balsam-fir fibers were used. The different properties of wood of spruce and that of balsam fir naturally suggest a different treatment of their fibres, which could best be accomplished by handling them separately. Experiments in this direction would probably open a much larger field for the use of balsam pulpwood than it now has.

Small Yield of Wood Fiber.

Another drawback to balsam as compared with spruce is its smaller yield in pulp and paper per cord of wood. Being lighter than spruce when seasoned it contains less wood substance per cord and so yields a smaller amount of pulp. The following figures regarding the yield of chemical and mechanical pulp per cord of spruce and balsam are based on actual experience and may be considered as average:—

	Ground pulp Pounds per cord.	Chemical pulp (sulphite) Pounds per cord.
Spruce.	1,800	1,200
Balsam Fir	1,500	1,000

This drawback, however, would not exist if the stumpage price of balsam pulpwood were proportionately lower than, instead of being nearly the same as, that of spruce. Some mill men even claim that the only objection they have against balsam fir is its smaller yield in pulp, which, at the same stumpage price as spruce, makes its use unprofitable and discourages any attempts to improve methods of utilizing or manufacturing it.

In comparison with spruce, balsam is a short-lived tree, and is apt to become defective by the time it reaches large size. A log from a large tree which may seem apparently sound will, when cut up into blocks, often show heart rot in some portion of its length, or, still more frequently, the fibers at the center will be of soft texture, making its use uneconomical. Decayed heart is not so common in young, small-size trees, and since small logs contain more sap and produce better fiber than large ones, balsam of small diameters is not only suitable for pulpwood, but is to be preferred to the large sticks.

Knots, though more numerous in small sticks than large ones, are not a serious objection. They can be cheaply removed by passing the chipped wood through a tank of water, in which the knots sink and the wood is carried off from the surface.

Balsam fir cut in winter produces firmer and harder paper than wood cut in summer.

The general tenor of nearly all pulp and paper manufacturers was that balsam fir is undoubtedly inferior to spruce in every respect, but that it has come into the pulp industry to stay. It fills a place in the economy of paper making, and its drawbacks are of such a nature that they may be to a great extent, if not entirely, overcome by intelligent effort.

In addition to the conifers, there are still untouched supplies of hardwood, which grow within the same region as the spruce, such as, maple, beech and birch, which are already finding use in the manufacture of chemical pulp and paper.

(To be Continued.)

PULP AND PAPER NEWS

The Central Pulp and Paper Co.. has been incorporated in Winnipeg with a capital of $200,000.

Among the new companies which have recently been granted incorporation is the John C. Gilchrist Lumber Co., of Toronto, with a share capital of $200,000.

Joseph Kilgour, of Kilgour Bros., Toronto, who is the President of the Canada Paper Co., and wife, have returned from spending several weeks in Florida and other southern States.

The latest aid for gardeners consists of seeds pasted into a strip of paper tape. All the gardiner has to do is to make a drill, lay the tape down, and cover it up. Nature does the rest.

The Interlake Tissue Mills, Limited, which are now turning out large quantities of crepe towels and toilet paper as well as other lines at Merritton, will shortly place on the market a fine range of decorative crepe papers.

The St. Lawrence Paper Mills Co., Limited, Toronto, have removed into their fine large new offices on the third floor at the front of the Bell Telephone Building where the different officers have splendidly fitted up quarters.

Robert Davis, president of the Don Valley Paper Co., Toronto, who has been confined to his home for several months is making fair progress towards recovery and it is expected that he will be able to be around as soon as the warm spring days arrive.

A charter has been granted to the John C. Gilchrist Lumber Co., Limited, of Toronto. The share capital is $200,000 and the incorporators are John C. Gilchrist, George H. Gilchrist, and Sinclair M. Gilchrist, George C. Patterson and Arthur S. Winchester, all of Toronto.

The Book Publishing Co., Limited, of Winnipeg, have been granted a charter with a capital of $20,000 to carry on a general printing, engraving and publishing business. The incorporators are Edward Campbell, William J. Eagleson, James McCubbing and John W. Mitchell.

The Roberts Advertising Company, Limited, of Toronto, have been granted a charter with a share capital of $500,000 divided into five thousand shares of one hundred dollars each of which two thousand shares is seven per centum preference shares. The company are given wide powers, and authorized to carry on a general advertising and publicity business in all its branches.

The George Powley Paper Co., Limited, which has been doing business in Toronto for a number of years made an assignment a few days ago to F. C. Clarkson, who is receiving tenders for the assets. The assets, which consist of paper, twine, matches, plant, warehouse and office furniture, amount to $5,788.36, and it is understood that the liabilities are considerably in excess of this sum.

The Fort William Printers, Limited, with head offices in Fort William, Ont., have been granted a charter. The incorporators are: John A. Head, John A. Dyke, Robert H. Neeland, David E. McKay and Peter Ross, all of Fort William. The company are empowered to print and publish newspapers and periodicals of all kinds, and to manufacture and deal in paper, envelopes, boxes and general stationery.

The Don Valley Paper Co., Toronto, have recently installed a 250 h.p. motor, and now all the equipment in the beater room is run by electric power. The company, which some time ago started the manufacture of antique covers in various colors, weighing from fifty to sixty pounds, report business as good in this line. They have just issued to the trade a neat booklet showing not only the new cover papers, but some fine specimens of colored Bristols, sulphite tag, mailla tag, colored poster and envelope manilla.

Owing to the breaking up of the ice in the St. Lawrence river and damming back the water at the first level of the Cornwall canal, the St. Lawrence Power Co. of Mille Roches, from whom the St. Lawrence Paper Mills obtain their power, have been somewhat handicapped for the past few days, and have had to shut down at certain times one of their machines as well as the calenders and other parts of the equipment. The trouble has now disappeared, and the plant of the paper company is again running.

Since the new tariff was brought into effect last autumn by the United States Government the exports from British Columbia have been doubled. The greatest gains have been in the shipment of shingles, lumber of different classes, ground wood pulp, etc. It is the general opinion among those in touch with the lumber situation that the placing of shingles on the free list has imparted a big stimulus to the industry in the Pacific Coast Province.

A. M .Huestis, of Toronto, who represents several Old Country and American mills has been appointed selling representative in Toronto and Ontario for the Georgetown Coated Paper Mills, Limited, of Georgetown. L. E. Fleck, vice-president and manager of the company, who has looked after the sales, will devote more attention to the executive and manufacturing end. The plant is busy and a very satisfactory year is reported.

The fire ranging system of Ontario will be extended and improved. Hon. W. H. Hearst, Minister of Lands, Foreests and Mines, has taken over the provincial parks from the Department of Public Works and a complete reorganization of the branch is under way. There will be telephone connection between the principal stations and more men employed and additional fire equipment acquired. In this way the chief ranger will be able to summon help from outside districts or to so place his men as to stop a fire from spreading. For this work the sum of $25,000 is asked.

At the Hydro-Electric Radial Field Day Convention, which was held recently at London, Ont., a resolution was passed calling upon the Dominion Government to assist the Hydro Railway scheme to the extent of $6,400 per mile bonuses and asking that the plans for the furtherance of the deep waterways projects be favorably acted upon, and it is likely that a large deputation will go to Ottawa. The deputation will be merged with that of the Waterways Association, which will ask for the immediate deepening of the Welland canal, of the Sault Ste. Marie canal, of the St. Lawrence canals and in the same connection for the preservation to public ownership of the water rights on these waters. Hon. Adam Beck, Minister of Power, pointed out that there is now about 6.000 feet a second of water available at Niagara for the development of power, and announced that tenders have been received from a number of development companies asking for these rights.. One of them—the most liberal—claims to be able to develop by an advanced method upwards of 100,000 horse-power. The right is asked to export only forty per cent of this, whereas existing companies are exporting fifty per cent. This company, however, asks the Ontario Government to pay $12 per horse power as against $9 paid to the Ontario Power Company. Instead of accepting this offer, Mr. Beck advocated the development by the municipalities themselves of the energy available by the construction of the new Welland canal, where he claimed it was possible to secure 224,000 horse-power at cost and twenty miles nearer the market. If radial railways were to amount to anything, they would, he said, create a market for this power, first for the operation of the roads and secondly by carrying power to districts that would not otherwise be available to secure it.

DRYDEN TIMBER AND POWER CO., LIMITED

(Special to Pulp and Paper Magazine)

The construction of the new Sulphate of Soda Pulp and Paper Plant of the Dryden Timber & Power Co., at Dryden, Ont., was completed in May of last year, and proved satisfactory in every way, with exception that the evaporator capacity in the Soda Recovery Room was found to be inadequate. During the last two months the vacuum evaporator has been enlarged to double its original capacity, and it is now capable of handling black liquor from the manufacture of a minimum of forty-five tons of Sulphate Kraft Pulp per day.

J. B. BEVERIDGE,
Dryden Timber and Power Company.

This reconstruction work has been completed; the mill is in operation again, and everything is working very satisfactorily. Forty tons of extra-strong pure Kraft pulp and Kraft sheathing paper are now being produced daily.

Dryden strong kraft pulp is very favorably commented on by manufacturers of high-test box board kraft paper. Those manufacturers of kraft paper, who are using Dryden pulp, have found that they can produce a kraft paper, testing over a point per pound, with less time in the beaters than is necessary to produce the same sheet from other makes of pulp. This is owing to the fact that the Dryden mill has a complete installation of beaters equipped with Basalt Lava stone rolls and plates, and all the pulp is well beaten; thus effecting an economy in time and power required when it reaches the paper mill.

Mr. J. B. Beveridge, the General Manager, reports the business outlook as being very good, contracts covering a large proportion of their kraft sheathing paper and kraft pulp production for this year having already been made.

Plant of Dryden Timber and Power Co., Dryden, Ont.

UNITED STATES NOTES

(Special to Pulp & Paper Magazine.)

The paper waste and rag warehouse of Fisher & Kurnitsky at 68 Liberty Street, Springfield, Mass., was destroyed by fire last week together with all its contents. The fire department responded to an alarm at 11.39 o'clock, but as the fire had already gained considerable headway, the firemen could do little except prevnt the spread of the flames.

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Edward L. Rantoul, formerly of Salem, Mass., is among those prominent in the development of a million dollar pulp company. A Massachusetts charter was issued last week at the State House to the Androscoggin Pulp Company, capitalized for $1,000,000. Associated with Mr. Rantoul in the corporation are James M. Wheaton and Richard S. Russell.

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E. M. Hancock of Milan, N.H., has taken the contract for a large quantity of pulp wood to be taken from timber lands near the Dead Diamond Wood on camps and storehouses, has already commenced.

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The Standard Paper Company, with principal place of business at Bellows Falls, Vt., has been incorporated with a capital stock of $9,000. It is authorized to manufacture and sell gummed and adhesive paper. The promoters are: Albert L. Brookhouse, Rowe C. Wales, George R. Wales, Alice T. Brookhouse, G. H. Thompson of Bellows Falls.

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Fire that started from unknown causes in the stock room of the George C. Gill Paper mill division of the American Writing Paper Company at Holyoke, Mass., several days ago, gave the members of the fire department a hard battle for more than an hour. The blaze was in a pile of paper shaving bales and between 15 and 20 of the bales were damaged. Several lines of hose were laid into the mill and after much effort the firemen succeeded in confining the fire to the bales.

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Several of the larger paper manufacturers of the United States have stated to the Interstate Commerce Commission of Washington that they have no protest to make against a raise in freight rates, but are willing to abide by the judgment of the commissioners. In view of the fact that what the commission says goes, the attitude of the paper men seems to be decidedly diplomatic.

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For the year ended December 31, the United States Envelope Company, of Springfield, Mass., reports a balance available for dividends of $581,658, a decrease of $50,481 from the earnings of the previous year.

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The Columbian Paper Company of Jackson, Miss., began the manufacture of pulp from pine wood last week. This is the first time the plant has even undertaken to manufacture pulp from pine wood, although a little pine has at times in the past been mixed with other woods used in manufacturing the pulp. There is a considerable amount of pine on the yards of the plant at Jackson, which will be used in experimenting with the manufacture of pulp from that wood.

Circular saws are made of paper for use in manufacturing veneer and fine furniture. Thin plates of wood cut by these saws are so finely finished that cabinet makers do not have to plane them at all before they are used. The saws, driven by an electric motor, are made from compressed drawing paper. Indeed, compressed paper of such hardness has been made that it has even been used in place of building stone.

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William R. McHaffie, who for a number of years has been general manager of the Lebanon Paper Mills at Lebanon, Ore., has been transferred to San Francisco, and will have charge of the company's office at that place. Mr. McHaffie will move his family to San Francisco at once. He will be succeeded in the mill by W. E. Graves, who has been mill accountant for six years. C. H. Ralston of this city will fill the vacancy made by reason of Mr. Graves promotion. C. J. Buchanan, of Oregon City has been appointed superintendent, with F. A. Waddock of Lebanon, as his assistant.

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Fire on March 1 destroyed the Bedford Paper and Pulp Company's mill at Big Island, Va., with a loss of $500,000 covered by insurance. The company will rebuild immediately.

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The stockholders of the Whitaker Paper Company, of Cincinnati, Ohio, have approved the proposal of the Board of Direction that the capital of the company be increased from $500,000 to $1,000,000. Of the increase $250,000 will be preferred, and the remainder common.

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Architect L. A. DeGuere of Grand Rapids, Mich,, is preparing plans for the rebuilding of the Borkaw paper mill, recently destroyed by fire. The new building will be of concrete, steel and brick.

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Peter G. Thomson, president of the Champion Coated Paper Company of Hamilton, Ohio, was placed on trial at Washington on March 5 on an indictment charging attempted bribery of a post office inspector. The Government charges that when the inspector found paper made by Thomson's company for postal cards below quality and refused to accept it, Thomson sent him $100 through the mails.

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C. J. Buchanan, night superintendent of the Willamette Pulp & Paper Company at Oregon City, Ore., who has been connected with that company for 22 years, has been appointed superintendent of the Lebanon Paper Company at Lebanon, Linn County, to take effect at once. His family will accompany him to that city.

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Lewis J. Powers, 13 years old, of Springfield, Mass., has invented an electrical paper counting machine which is to be given a try-out in the big paper plant at Springfield, owned by his grandfather, L. J. Powers. The youthful inventor worked out the main principles of the machine while in a hospital convalescing from an operation for appendicitis. If the counter in actual use proves as efficient as preliminary tests indicate the inventor will receive a handsome royalty from his grandfather. He has already applied for a patent.

According to a report just received the lumber cut on the Kennebec River in Me., and its tributaries will exceed that of last year. The total cut as estimated is 207,750,000 feet, whereas last year the total cut as reported was about 138,000,000. The total on Moose River is about 58,650,000 feet, and of this 22,000,000 is held up to be sawed at the landing; Moosehead Lake region, 44,600,000 to be taken by rail; Dead River, 30,385,000; East Branch and Main Kennebec, 40,945,000; 11,500,000 feet is to stop at North Anson, to be used by the Newcastle Lumber Co., and some at Bingham. The lumber concerns cutting the largest amount include Hollingsworth & Whitney, about 50,000,000 feet; Great Northern Paper Co. about 21,000,000 Lawrence Bros., about 12,000,000; Newcastle Lumber Co., 11,500,000 for North Anson, 3,500,000 for Jackman; Skinner-French, 8,000,000 for Skinner Bingham Lumber Co., 6,000,000; W. T. Haines, 7,000,000 at Dead Water; Hume & Newhall, about 8,000,000. Lumbermen report that the condition for operating has been good so far this season, with the exception of too little rain.

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The officials of the American Writing Paper Company of Holyoke, Mass., held a banquet one evening last week at the Nayasset Club in Springfield. Including a number of invited guests, there were 53 in attendance. General Manager Alfred Leeds presided. Fred. H. Sturtevont was chairman of the committee of arrangements. The affair was informal with few stated addresses; and despite the excellence of the menu, the assemblage broke up at an early hour.

RIORDON EARNINGS.

Riordon Pulp & Paper Co. profits for 1913 were $228,073 as compared with $226,250, a year ago. Figures showing the amounts paid as interest and depreciation allowance are as follows:—

	1913.	1912.
Profits	$309,679	$306,834
Depreciation	48,953	30,399
	$260,726	$276,435
Interest	32,653	50,185
Net profits	$228,073	$226,250

Sales for 1913 fell short of 1912 by $98,946. In spite of which, profits were slightly larger. The statement may be considered very satisfactory considering general conditions.

Sulphite Pulp Mill capacity is now forty per cent greater and the company has increasing lumber output by operating at nights. Eighty-four per cent of the company's products for the year is already sold at satisfactory prices. During the year the company expended $536,000 on property making fixed assets $6,032,841. Current assets, $1,866,317, current liabilities, $1,258,037, against $1,453,988 and $361,882 respectively a year ago.

At the annual meeting of the Toronto Reform Association held last week, Major A. A. Mulholland was elected president. Major Mulholland who is now residing in Toronto retired from business three years ago. He was former president of Northumberland Paper and Electric Company of Campellford, Ont.

ONTARIO WORKMEN'S COMPENSATION ACT.

(Special to Pulp & Paper Magazine.)

Ottawa, March 13.

The Workmen's Compensation Act, which will come before the Ontario Legislature this session, has been endorsed by labor men throughout the province. They have asked the support of the members to prevent any changes in the maximum amount of indemnity in the Workmen's Compensation Act. The Canadian Manufacturers' Association are, on the other hand, not inactive, and Secretary G. M. Murray has addressed a letter to the M.P.P.'s on the subject in which he says, in part:—

"In legislating upon a subject surrounded with so many complexities and fraught with such far-reaching possibilities to the industries of the Province, we assume that you will welcome any information that you can obtain from those who have given the subject careful study. To this end we purpose sending you from time to time during the next few weeks while the matter is under discussion, memoranda on different phases of the subject. We ask you to assume that in doing so we will be actuated by a desire to assist in securing for the Province the very best act that it is possible to advise. We appreciate that there are features of such legislation which must necessarily be in some measure an issue between conflicting interests, but there are a great many features of a workmen's compensation bill, the greater part of the features, in fact, in which the interest of employers, workmen and the community in general is common.

We recognize that there is a tendency on the part of those who have not been in touch with the work which the association has done in connection with workmen's compensation to assume that 'the manufacturers are fighting the workmen's compensation bill.' Our draft bill which is on record in the Commissioner's report, is a standing and unanswerable refutation of any such charge. We have not opposed, and are not opposing a reasonable, in fact, liberal compensation measure. Our work throughout the whole of the Commissioner's investigation, covering intermittently a period of three years, has been of a constructive, and not a destructive character, and nothing in our action during the discussion of the measure in the House will depart from our past policy. The memoranda which are to follow, dissociated as they will be from anything in the way of a personal canvass, will, we hope, be a further evidence of our desire to prove of service."

CANADA PAPER MAY PAY BACK DIVIDENDS.

Earnings of the Canada Paper Company for the past year, while they were considered satisfactory were not quite as high as in 1912, according to the annual statement presented to the shareholders.

No reference was made to the question of dividends, but it is understood that the directors propose to carry through a plan which was formulated some time ago to make a settlement by which preferred dividends for three years, or 21 per cent in all, should be paid, shareholders relinquishing all claims of the balance. Ninety per cent of the shareholders have accepted this plan.

The company has outstanding $200,000 first mortgage bonds, $150,000 second mortgage bonds; $344,100 preferred stock, and $588,600 common stock.

The board of directors was re-elected as follows: Jos. Kilgour, president; Sir H. Montagu Allan, vice-president; H. S. Holt, C. R. Hosmer, F. W. Molson, Hon. Robert Mackay.

BRITISH TRADE NEWS

SPECIAL TO PULP & PAPER MAGAZINE

(Special to Pulp & Paper Magazine.)

London, March 2, 1914.

Owing to the high costs of coals, chemicals, pulps, freightage and the general increase in wages, paper mill owners in the United Kingdom are giving serious attention to their machinery and other plants with a view to bringing down the cost of production to the smallest minimum without in any way interfering with the quality of paper they are noted for. The result is that firms supplying machinery and other incidentals are having a brisk time, amongst them being Messrs. Walmsley & Co., Ltd.; Bertrams, Ltd.; James Bertram & Son; Spencer & Sons; The West-End Engine Works Co., Ltd.; Milne & Son, Collis & Sons; T. J. Marshall & Co., Geo. Christie, Ltd.; Porritt Bro. & Austin, and Fox, Stockell & Co. These well-known firms report a brisk period of business with the mills, and in addition, greater attention is being given to electricity for power and lighting purposes. Walmsley's are engaged on several machines, whilst Messrs. Bertrams, Ltd., have just started up one of the very latest papermaking machines at Bridge Hall Paper Mills, in Bury, Lancashire, and have four others on hand for firms who make high grade papers. The Wall Paper Manufacturers, Ltd., have had erected a machine which carries a wire of 106 inches and 50 feet long, and is complete with stuff chests, pumps, two patent full driven strainers, etc. At Bristol, the Imperial Tobacco Company of England and America has erected a new board mill for their own use. It is run by electricity and no expense has been spared. It is reckoned to be one of the most modern mills in existence. English firms supplied the machinery.

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The trade union label question has not yet been seriously considered by the British paper makers. The unions want all the mills to employ trade unionists, pay trade union rate of wages, and display the trade union label. If they do not fall into line the unions are threatening all sorts of penalties. The position of the unions and the mill owners is like that of the Biblical story of little David and Goliath, the only difference being that the manufacturers will require a lot of "slaying." Altogether there are 50,000 workers engaged in the production of paper in the United Kingdom, and it may be pointed out the unions have not even 15,000 of these workers within their ranks. With this great deficiency, they contend that they are going to force the mill owners into the method of adopting the label to show that the paper from their mills is made by trade union workers, and to enforce their object all the trade federations and other labor bodies are to be called upon to use their best efforts to reject paper which is not produced according to the principlesf or which the label stands. A more fallacious idea was never in the history of British papermaking put forth, particularly as the unions are representative of a very small minority. It appears the assistance of the American paper makers brotherhood is to be requested in helping the unions on with the movement. Of course, all these objects sound nice, and read nice on paper, but when the British mill owner is properly approached on the label question, it is to be feared the unions will receive the greatest shock they have ever experienced since coming into existence.

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By the way, the Paper Mill Workers' Union in Lancashire is trying to patch up a little discontent, and the incident goes to point out that when they (the workers) cannot agree among themselves, what would things be like assuming that they had control of all the British mills as trade union mills? In the Bury district the other night the workers who belong to the union gathered together to consider the decision of their Executive Committee on the question of splitting the Bury, Radcliffe and Ramsbottom branch. The branch desired to remain as at present with a paid secretary. Mr. Ross, the general secretary of the union, explained in some straight talk to some of the recalcitrants that the Executive's decision must be adhered to, and that until such times as the branches were formed separately and put themselves in compliance with the rules as regarded the working of the branches, they could not have any delegates at the annual meeting of the union, and the sooner those two districts got together and elected their officials it would be better for them and the union. The Executive also send down word to Lancashire that as soon as possible definite steps should be taken to form a district conference for Lancashire and neighboring counties. Needless to say, there were some very strong protests and arguments against this dictation of the Executive of the Union to its paying members, but no resolution was put before the meeting. Mr. Ross and his union are now in the South of England trying to get paper mill owners to shut their mills down for a Saturday half-holiday, but so far, no information has leaked out as to the progress made.

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A report has reached England from Berlin stating that the German Wallpaper Convention has been renewed for a further period of twelve months. Of the 55 German Wallpaper manufacturers, 30 are now members of the Convention, and it has been decided to make an attempt to induce the others to join. It is also stated that business is not particularly good at present in the "Fatherland," so that one may now expect an influx of wallpaper travellers and agents in the United Kingdom, America and Canada, as an outlet must be got somewhere to keep the machinery going.

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The Lord Mayor of London (Sir T. Vansittart Bowater) who is head of the firm of W. V. Bowater & Sons, is going in State to spend a week-end in his native city of Manchester. The Manchester Corporation have decided that the State apartments in their town hall should be occupied by Sir Vansittart, and, in addition, he is to have the freedom of the city conferred upon him as he is the first Manchester man who has occupied the Mayoral chair of London since the 17th century. Sir Vansittart has a great wish for Canadians, and their paper trade, and one of the first things he remembered when he was elected to his present position was to send his greetings to Canada by the medium of the Pulp & Paper Magazine.

The Waterside Paper Mill Co.'s mill at Darwen, or, to be precise, at Grimshaw, close to Darwen, has been partly destroyed by fire. The damage is estimated at $48,000. During the early part of the morning on the 23rd February, two workmen were getting things ready for the mill workers, and they noticed a quantity of waste paper on fire. It spread rapidly, and one of the men ran to a telephone to ring up the local fire brigade. Unfortunately he was totally ignorant as to how to use the 'phone, and his efforts were unsuccessful. The other man spent his time trying to extinguish the flames, and in doing so got badly burnt. With this delay the fire spread furiously and no brigade was on the scene until someone in a neighbouring works observed the outbreak and by a stroke of good luck managed to call the local fire-fighters up by the telephone. They were soon on the scene, but they arrived too late. The splendid mill, which turned out cartridges, bagging papers, envelope papers, and other kinds on a 90-inch machine, now stands with only the bare walls and about 200 workers are idle. The mill was a neat, compact little structure and was doing splendidly. It cannot be too often pressed home to Canadian mill owners that for the protection of their property it is absolutely necessary to have a well equipped fire brigade on the spot—men who are drilled and trained with up-to-date appliances—and if this is insisted upon, they will find that money spent on fire-fighters is money well invested. A good fire often makes a mill owner realise his position and want of common-sense.

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The directors of the Culter Mills Paper Company, Ltd., Scotland, have submitted their balance sheet to the shareholders for the year ended 31st December, 1913. The profit for the year is £8,829 18s. and this added to the balance of £3,345 carried from the previous year, makes a disposal balance of £12,175, which the directors recommend be disposed of as follows:—By paying a dividend of 5 per cent absorbing £3,500; by carrying to works and property, thus reducing their value to £78,000, £6,141; by leaving at credit of profit and loss account £2,533. In their last report the directors expressed their belief that the profits of the year now under review would be seriously affected by increases in the prics of coals, and of raw materials. These increases have continued throughout the whole of the year, and are still maintained. In addition to this, considerable loss and inconvenience have arisen from frequent interruptions to the manufacture through the installation of new plant, including the rearrangement of power. These interruptions, however, will now be at an end, and as bearing on the prosperity of the mill, the fact deserves to be noted that the new plant and the power rearrangement are working very satisfactorily. As previously announced in the Pulp and Paper Magazine, a fire occurred at the mill on January 10th, by which the rag-house, the esparto dusting house and part of another house were wholly destroyed. The reinstallment of these buildings, which were insured, is now being proceeded with.

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Amongst the paper mills which have declared dividends during the past couple of weeks are:—Townsend Hook & Co., Ltd., for year 1913, 7 per cent, a profit of £21,507 being made; Mather & Platt, Ltd., for 1913, 10 per cent, a profit of £164,524 being made; Annandale & Sons, announce a balance of £4,855 10s 9d to credit of profit and loss account. The London Paper Mills Co., Ltd., are petitioning for the confirmation of the reduction of the capital of the company from £200,000 to £106,250.

WATERGLASS IN PAPER SIZING.

A. Frohberg describes a method of paper sizing which consists in forming a gelatinous precipitate of silicate of alumina in the pulp by the inter-action of sulphate of alumina and waterglass. Sulphate of soda is, of course, also formed if soda-waterglass is used, as is practically always the case.

Magnesium sulphate, a cheaper salt than aluminium sulphate, has been proposed as a substitute for the latter, but the pulp is made too alkaline. At the same time it is quite possible to replace part of the aluminium sulphate by the magnesia salt. A mixture in which the various acids and bases are in the following weight proportions: SO_3, 823; MgO, 337; Na_2O, 517; Al_2O_3, 67; SiO_2, 500.

More than 90 per cent. of the alumina, magnesia, and silica used are obtained in the size which is, however, alkaline. If the Al_2O_3 is doubled, the size is nearly neutral, but the proportion of the compounds obtained as size falls from 90 per cent to 55 per cent, the rest going into the backwater. The addition of starch saves part of this loss. Pulp sized with silicate can not be dyed with basic dyes, but the direct cotton colors can be used.—Wochenblatt fur Papierfabrikation.

G. B. STEFFANSON GOES TO BATHURST.

Mr. G. B. Steffanson, of the Canada Paper Co., Windsor Mills, Que., has been appointed chemical engineer for the Bathurst Pulp and Paper Co., recently organized to build sulphite mills at Bathurst, N.B. He will have charge of the design of these new sulphite mills. Mr. Steffanson is a Scandinavian, who has had an extensive experience in Sweden in building and operating sulphite mills. He has been in Canada about five years, and is well known to the readers of the Pulp and Paper Magazine, through his practical and technical articles. He will take up his new work at Bathurst on April 15.

A COMMERCIAL DAILY FOR MONTREAL. MR. FIELDING, EDITOR.

The most interesting announcement of the most interesting newspaper situation of Montreal, was that made on Friday, by the Industrial & Educational Press, owners of the Pulp and Paper Magazine, the Journal of Commerce, and other technical journals, to the effect that the Journal of Commerce would be made a daily paper, with Hon. W. S. Fielding, as editor, and J. C. Ross, the present editor, as managing editor. The new journal will be very similar to the Journal of Commerce of New York, and will be a daily paper on Commerce in its broadest sense. It will deal with finance, insurance, markets, stock exchange, news and the general commercial and economic aspects of the country. It will also be a newspaper, giving in condensed form, world's news and the news from our own country. Murder trials, society news, and sporting pages will not figure in it, but it will be a broad-gauged, independent business man's daily news and commercial paper.

It will be published on the presses of the Industrial and Educational Press, Limited.

The Markets

CANADIAN MARKETS.

The market for news print is steady and all mills are well employed. It is generally admitted that, while the paper and pulp trade has been passing through a period of several months of quietness and smaller orders as compared with the great activity of a year ago, that the news mills have felt the depression less than any other branch of the business. Book and writing mills are fairly well employed, but business has not yet picked up to the extent which it was expected to, and orders are for the most part small, and contracts are fewer. The ground wood market is very quiet at present and prices are weaker. It is reported that some mechanical pulp has been sold of late at a considerably reduced figure. On the other hand the prices for sulphite pulp are firm and the stocks are low. The outlook for the coming year is also good, and one of the largest companies in Canada has already contracted for over eight per cent of its output during the present year, which is very satisfatcory. The rag and paper stock market remains practically unchanged, and the only flurry has been a stiffening in the quotation for roofing stock. Paper houses report that business in their lines is picking up. January was a rather dull month after the holiday activity, but February witnessed a considerable improvement. In small quantities there is still considerable price cutting going on in fibres and manillas. The following quotations prevail, f.o.b. Toronto:—

Paper.

News (rolls $1.95 to $2.00 at mill in car load lots.
News (sheet) $2.15 to $2.25, at mill in car load lots.
News (sheet $2.25 to $2.75 at mill in less than car load lots.
Book papers (carload) No. 3, 3.75c to 4.25c.
Book papers (ton lots) No. 3, 4c to 4.50c.
Book paper (Carload) No. 2, 4.25c.
Book paper (ton lots) No. 2, 4.50c to 5.25c.
Book papers (carload) No. 1, 4.75c to 5.25c.
Book papers (ton lots) No. 1, 5.25c to 6.00c.
Writings, 5c to 7½c.
Sulphite Bond, 6½c to 7½c.
Grey Browns, $2.00 to $2.50.
Fibre, $2.75 to $3.50.
Manilla B., $2.40 to $3.50.
Manilla, No. 2, $3.00 to $4.00.
Manilla No. 1, $3.25 to $4.25.
Unglazed Kraft, $3.75 to $4.50.
Glazed Kraft, $4.00 to $5.00.

Pulp.

Ground wood (at mill), $15 to $16.
Ground wood, $21 to $23, delivered in United States.
Sulphite (unbleached), $42 to $43, delivered in Canada.
Sulphite (unbleached), $42 to $44, delivered in United States.
Sulphite (bleached), $56 to $57, delivered in Canada.
Sulphite (bleached), $57 to $58, delivered in United States.

Paper Stock.

No. 1 hard shavings, $1.87½ to $1.90.
No. 1 soft white shavings, $1.75 to $1.80.
No. 1 mixed shavings, 50c.
White blanks, 90c.
Ordinary ledger stock, $1.15 to $1.20.
Heavy ledger stock, $1.40 to $1.50.
No. 1 book stock, 70c.
No. 2 book stock, 45c to 50c.
No. 1 Manilla envelope cuttings, $1.10 to $1.15.
No. 1 print Manillas, 60c.
Folded news, 45c to 50c.
Over issues, 50c to 52½c.
No. 1 clean mixed paper, 30c.
Old white cotton, $2.50 to $2.75.
Thirds and blues, $1.30 to $1.32½.
No. 1 white shirt cuttings, $5.00 ta $5.25.
Blue overall cuttings, $3.50 to $3.60.
Black overall cuttings, $1.75.
Black linings, $1.75.
New light flannelettes, $4.50.
Ordinary satinets, 75c to 80c.
Flock, 85c.
Tailor rags, 70c to 75c.

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Quotations f.o.b. Montreal are:—

Book and News Paper.

Roll News, $40 to $43 per ton for large orders; $45 to $50 per ton for small orders.
Ream News, $45 to $47 per ton for large orders; $50 to $60 per ton for small orders.
No. 1 Book, 5¼c to 6c per lb.
No. 2 Book, S.C., $4.50 to $4.75 in large quantities; $4.75 to $5.50 in small quantities.
No. 3 Book, M.F., $4.00 to $4.25 in large quantities; $4.40 to $4.50 in small quantities.
Writings, 5c to 7½c.
Sulphite Bond, 6½c to 8½c.

Wrappings.

Grey Brown, per 100 lbs., car lots, $2.25 net; 5 tons $2.45; 2 tons, $2.55; 1 ton, $2.65; less, $2.75.
Red Brown, car lots, $2.85; 5 tons, $2.95; 2 tons, $3.05; 1 ton, $3.15; less $3.25.
B. Manilla, car lots, $2.85; 5 tons, $2.95; 2 tons, $3.05; 1 ton, $3.15; less, $3.25.
No. 2 Manilla, car lots, 3.10; 5 tons, $3.20; 2 tons, $3.30; 1 ton, $3.40; less, $3.50.
No. 1 Manilla, car lots, $3.25; 5 tons, $3.45; 2 tons, $3.55; 1 ton, $3.65; less $3.75.
Kraft, $3.75 to $5.00.
Fibre, car lots, $3.25; 5 tons, $3.45; 2 tons, $3.55; 1 ton $3.65; less $3.75.

Most of the manufacturers are quoting 10 per cent. less than the above prices to the jobbing trade on the cheaper lines of wrapping, such as B. Man., No. 2 Man.—grey and red browns.

Pulp.

Sulphite easy bleaching, $43 to $45 per ton.
News quality, $41 to $42 per ton.
Bleached sulphite, $54 to $59 per ton.
Kraft pulp, $3.60 to $4.00.
Ground woods, No. 1, $15 to $16.
Ground wood, No. 2, $22 to $24, delivered United States.

NEW YORK MARKETS.

209 Broadway, N.Y., March 13, 1914.

Chemical pulp has remained practically unchanged in the local market during the last two weeks. Importers have received large consignments, which were immediately shipped to paper mills to satisfy orders on old contracts. There has been some inquiry for new contracts in both bleached and unbleached sulphite, but few new contracts closed. Prices are unchanged, but the tendency is upward, and the general feeling is that values are now at rock bottom. Delays in the arrival of steamers carrying rather large consignments of sulphate and kraft pulp created a shortage of supply here, which was so low that spot orders of good size were impossible to fill. Although contract quotations are unchanged, spot orders have been commanding $1.87½ to $1.95 a hundred pounds. Reports from mills show that the past two months' production has been only a little below normal and the feeling is that pulp supplies have been pretty well used up. Consumption on old contracts is now about up to normal, and the next month will bring about an active wood pulp market.

The continued cold weather has prevented the grinding of wood in water power mills and shipments on old contracts as well as spot orders has greatly reduced the storage supply of mechanical pulp. The excess supplies at paper mills have, in practically all instances, been consumed and there is a fair demand for more stock. Spot orders are numerous, and it has been the desire of paper mills that deliveries be prompt. Such orders are commanding from $22.00 to $25.00 a ton delivered for No. 1, while No. 2 ranges from $17 to $19.50 a ton delivered. On new business there are practically no contracts for No. 1 below $16.50 a ton at the mill. Old contracts in most cases are pretty well cleaned up and the next few weeks will undoubtedly reflect an active market with prices more favorable to the grinders.

Local importers of foreign rags have been a little busier with the balances of their old contracts which are now nearly wound up. There is a good deal of spot buying with orders for quick delivery which is taken as good evidence that there are only small supplies at the mills. Prices are very low and the range of new stock abroad is going down. The low grades are practically without inquiry. The storms of the past two weeks have caused great difficulty in the delivery of domestic rag stock which is now in a little better demand. Fairly good sized orders in the higher grades have been closed by the dealers at prevailing quotations. Roofing stock has been practically dead for several months but the last two weeks has shown some activity in satinette garments at 1.10 to 1.15. The condition of the weather has prevented collections and it is the general opinion that this will influence the market in the near future as the accumulations which were found a tthe mills the first of the year are now well cut into and new supplies will be necessary with rather small collections to be drawn from. There has been a little softening in the prices of old jute bagging, but the other grades are fairly well maintained and the demand is a little better than for some time. Shipments of paper stock practically ceased during the interval on account of the blizzard and snowstorms which followed and tied up all branches of traffic. The railroads could not turn the large bales into the public storage on the three day custom.. Most activity was in straightening out complaints while new business was at a standstill. Soft white shavings have fallen off in inquiry and the price is at inside figures. The amount for shipment has fallen in some cases from 100 to 35 tons or less a week. The lower grades are in better demand now which was the condition last year when mixed papers and old news were in strong inquiry and prices high. No. 1 mixed papers are commanding 40 to 45 while strictly overissue is quoted 67½ to 72½. As soon as deliveries can be made more freely still higher prices in the low grades are anticipated.

Pulp.

Ground Wood, No. 1, $20 to $24, delivered.
Ground Wood No. 2, $17 to $19.50, delivered.
Unbleached sulphite, domestic, 1.90c to 2.20c per pound, delivered.
Unbleached sulphite, imported, 1.75c to 2c per pound, ex-dock, New York.
Bleached sulphite, domestic, 2.80c to 3c per pound, delivered.
Bleached sulphite, imported, 2.60c to 3.05c per pound, ex-dock, New York.
Easy Bleaching sulphite, imported, 2.05c to 2.20c per pound, ex-dock, New York.
Unbleached sulphate, imported, 1.75c to 2.10c per pound, ex-dock, New York.
Bleached sulphate, imported, 2.60c to 2.80c per pound, ex-dock, New York.
Kraft pulp, imported, 1.80c to 2.00c per pound, ex-dock, New York.
Soda pulp, domestc, 2.10c to 2.25c per pound, delivered.

Paper.

Business in all lines in the local market was very poor during the interval on account of the severe snowstorms which has struck this section. Deliveries on old orders were checked and the trade was kept busy answering complaints from customers. Mail orders were few as trains carrying mails were delayed for many hours. Reports from New England showed that there had been a big rainstorm which greatly added to the water supply and eased power conditions which the cold has in some instances seriously tied up. The production of paper in all grades was about 90 per cent. of normal during the past two months and advices from producers show that at least 98 per cent of the production during January and February has been shipped. The local market in all grades has been firmly maintained with the exception of tissue which has been affected by a cut in No. 1 whites. Certain mills however refuse to quote less than 42½c. on 1000-ream and car lots. Orders of less than car lots are commanding 45c. to 47½c. A New York State mill offered what was claimed to be a No. 1 Manila to local trade at 40c. The price was considered too high and counter offers of 38c. were made for the paper which the bidders considered proportionately below a No. 1 Manila. No. 1 Manila is in fair inquiry at 42½ to 45 on less than 1000-ream and car lots and 40c. on car lots. Kraft tissue is in better demand and the price is firm at 47½ to 50c. Transient orders of roll news have been rather numerous at prevailing values. About all contracts for roll news have beeen closed at 1.95c. to 2c., f.o.b. mill. Sheet news has been in fair inquiry and the price has been firm. Side runs are now rather plentiful and the demand has been a little easier. Some cutting of the market price was reported in the intervel and it is said that several orders were closed at 2c. against the market price of 2.05c. to 2.10c. Paper bags have been in poor inquiry and some cutting of prices in Boston, New York and Philadelphia has been reported. Shipments on the 1913 price list are continuing in satisfaction of old orders which were made before the new list went into effect. Paper bag men on the whole are anxious to maintain the new price list and it is probable that the cutting reported in the interval is of only temporary nature. Writings bonds, ledgers and linens are in fair demand and the higher grades are especially requested at prevailing prices. Book papers are in good demand and deliveries which have been slow were beginning to become easier until the storms which again set them back. Coated book is in softer tone although the market has been very active for the last few months. Kraft papers are still at very low prices and inquiry for them is rather slight, although new products have been designed since the first of the year and it is believed that a more active market is not far distant. Manilas, fibres and wrapping papers have been quiet, but prices are firmly maintained. New boards have been in good inquiry and the price is hardening, some manufacturers raising their value from $30 to $32, to $31 to $33 a ton. Straw boards have also been in good demand at prevailing quotations. Blotting papers have had a good month, producing about 92 per cent. of normal and disposing of 99 per cent. of this production. Toilet papers and power towels have had a fairly good demand but business is not up to anticipations. Cigarette papers are moving normally and are firm in price. Current quotations follow:

News, rolls, transient business, $1.95 to $2.05 f.o.b. mill.
News, rolls, contract renewals, $1.95 to $2.00, f.o.b. mill.
News, side runs, $2 to $2.10 f.o.b. mill.
News, sheet, $2.25 to $2.30 f.o.b. mill.
Book papers, car lots, C. & S. C., $4.00 to $4.50 f.o.b. mill.
Book papers, car lots, M.F.S., $3.75 to $3.90, f.o.b. mill.
Writing paper superfine, 13½c to 17c, del. east of Miss. River.
Writing paper, extra fine, 11c, del. east of the Miss. River.
Writing paper, No. 1, fine, 9c., del. east of the Miss. River.
Writing paper, No. 2, fine, 8c, del. east of the Miss. River.
Writing paper, engine sized, 4½c to 8c, del. east of the Miss River.
Bond paper, 5c to 24c, delivered east of Mississippi River.
Ledger paper, 8c to 30c, delivered east of Mississippi River.
Linen paper, 7c to 1c8, delivered east of Mississippi River.
Manila jute, 4¾c to 5¼c, delivered.
Manila, wood, $2.40 to $3.00, delivered.
Kraft, No. 1, $3.50 to $3.75, f.o.b., mill.
Kraft, No. 2, $3.25 to $3.50, f.o.b., mill.
Boxboards, news, $30 to $33 per ton, delivered.
Boxboards, chip, $28 to $31 per ton, delivered.
Boxboards, straw, $28 to $31 per ton, delivered.
Wood pulp board, $42.50 to $45 per ton, delivered.
Tissue, white, cylinder, 40c. to 45c. delivered.
Tissue, fourdrinrie, 47½c to 52½c, delivered.
Tissue, jute Manila, 40c. to 42½c. delivered.

* * * *

The annual meeting of the stockholders of the American Writing Paper Co., of Holyoke, Mass., was held several days ago, at Oranga, N.J. Two new directors were elected, viz: Edwin Packard, of Brooklyn and R. J. Burr, of New York City. The company elects six directors each year, the others being re-elected. The directors re-elected were W. N. Caldwell and Geo. B. Holbrook, of Springfield, Geo. B. Noble, of East Hampton, James G. Storrow, of Boston and J. W. Ogden of New York. The new directors succeed W. E. Houston and the late W. H. Taylor.

* * * *

Albert G. Durgin of the Chemistry Department of the University of Maine, read an interesting paper last week before his students on, "The Making of Paper Pulp." He traced the industry from its beginning which was long before the Christian era when all the labor was done by hand in a long and tedious process. "Soon," he said, "hot lime came to be used and as a result the industry spread through Persia, Spain, France and Germany, and, finaly, 1600 years after the discovery of the use of wood pulp, it reached England. The first machine used in the pulp industry was used in 1843. In 1857 the first patent was secured for a pulp machine. After 1863 when the Sulplaid process was discovered the evolution of the industry was more rapid, until at the present time pulp and paper manufacturing is one of the five most important industries in the United States. Maine now leads in the industry with New York State second."

NORWEGIAN MARKETS.

Norway, Christiania, Feb. 21.—English buyers are still doing very little in either Mechanical or Chemical Wood Pulp. The tendency for Mechanical is rather uncertain; while it is maintained in some quarters that prices are firmer, others say that they are receding.

America has again bought Sulphite; one sale of 2,000 tons Easy Bleaching for America is reported and there are still enquiries from this quarter; other markets have also bought this week, but not England, and makers are satisfied with the situation.

Sulphate is hardening and after large sales in January makers have advanced their quotations.

America has commenced buying paper from Scandinavia and the paper market seems to be on the point of improving from the heavy depression under which it has suffered the last half year.

THE BRITISH MARKETS.

(Special to Pulp & Paper Magazine.)

London, March 4, 1914.

There is an improved demand for newsprint in the British paper trade, and mills are being kept moderately busy supplying the consuming channels. Taking things generally there is a better feeling in the paper markets, and agents report that prospects are brighter now than was the case at the beginning of the year. Business, however, cannot be said to be in a flourishing state. In fine printings and writings a fair amount of trade is passing, particularly on export account, but prices obtained are still disappointing, owing to the increase in the cost of production. Wrappings, envelope papers, and other grades that are usually associated with "other kinds" of papers, are having a good outlet and everything points to a good time coming. There is no doubt the British paper mills want a good rush of orders to recoup them after the slackness that prevailed towards the latter part of 1913. In a large number of cases decreased profits have recently been reported and, of course, the keen competition amongst the mill-owners and the foreign makers makes it impossible to get an extra per centage on paper. One mill company in its 14th annual report says: "The directors regret that this year's report should be so unsatisfactory, but this is entirely due to the continued and largely increased manufacturing costs, owing to the rise in price of coal, all raw materials, and also to an increase in wages." Roughly, the British mills exported to Canada in February 113 tons 5 cwts. of printing paper; 4 tons 17 cwts. of writing paper; 8 tons 15 cwts. paper hangings; and 1 ton 18 cwts. of other kinds of papers. Canada exported 350 tons 15 cwts. of wood pulp boards to the British markets, which is a rough calculation in the absence of the Trade Board figures, which will appear in another week.

* * * *

The sulphite and sulphate markets are very dull, and buyers are still doing little or nothing, though prices are easier. One or two deals with Swedish and Finnish mills have been closed at exceptionally low prices, which have somewhat upset the expectations of the Scandinavian mills. From Scandinavia comes the news that America is making enquiries in the markets there, but no big sales are announced. The German markets are also said to be dull. In England deliveries on running contracts appear to be arriving in rather large quantities, but this is no doubt due to the slight improvement in the paper trade. Prices are now about as follows, c.i.f. British ports:—

Bleached Sulphite	$56.40	to	$58.80
Easy Bleaching Sulphite (No. 1)	41.90	to	42.60
News or strong quality	37.20	to	37.80
Unbleached soda (No. 1)	36.90	to	40.56
" " (Strong quality	36.60	to	36.90
Soda Kraft	38.40	to	38.70

* * * *

The mechanical pulp position has changed very little, and business is not as brisk as makers would like it to be. The same state of things exists on the Scandinavian side. Prices now are:—

Pine 50 p.c. moist, prompt (unwrapped	$9.60	to	$9.90
Pine, dry, prompt	19.20	to	19.50

For forward delivery add about half a dollar to above prices.

* * * *

Since October last the market for Esparto has been steadily rising. The market is now strong, and sellers are not in a good position to offer Spring shipments. Prices are firm with a tendency to reach a higher level in the near future. Indeed, it is a good many years since Esparto reached the high prices that are ruling at the present time.

* * * *

There is a good demand for rags on home and export account, and dealers report that they are satisfied with the current of business that is passing. During February about 121 tons of rags and paper stock were shipped to Canada.

* * * *

The chemical trade is steady and large shipments are leaving for the States. Bleaching Powder is $26.40 per ton; caustic soda $43.20 to $44 for 76 per cent and 77 per cent; and Ammonia Alkali $16.80 to $17, according to package. China Clay is in great demand, while contracts for other fillings have all been closed for the year.

NEWS FROM NORTH EUROPE.

The Russian Government has forbidden the cutting of pulpwood of small dimensions in the province of Smolinsk. This will not only affect Russian mills on the Baltic coast, but also German and to some extent Norwegian mills.

The Oji Paper Mills of Japan have decided to build a 20-ton sulphite pulp mill in the new province of Sakhalin to be started in 1915. This is considered an experiment and large mills are expected to follow as Sakhalin is abundant in wood suitable for the manufacture of sulphite pulp.

The J. E. Enguist, A. B. of Tammerfors, Finland, have a 25-ton sulphite pulp mill under construction.

Mild weather indicates that the navigation in the Baltic will open early this year.

Four sulphate pulp mills, of 280 tons combined daily production,are under construction in Sweden.

A. B. Mo. Domsjo, of Hernosand, Sweden, have decided to increase their sulphite pulp production by 20 tons a day.

Several Swedish sulphite pulp mills have during the last year installed pyrite burners, these having superseded their sulphur burners.

Edward Lloyd, Ltd., have installed two more cylinders in their ground wood pulp mill at Vittingfos, Norway. Two further grinders may be added shortly

The Sagbrugsforeningen, Fredrikshald, Norway, are installing three more pulp wood grinders each 600 h.p.

A. S. Skjaerdalen Bruk are contemplating building a sulphate pulp mill in Ringerika, Norway..

Another Norwegian ground wood pulp mill has closed down permanently; the power is to be sold for domestic purposes.

A. S. Rena Kartongfabrik have under construction at Rosvold, Norway, a 25-ton board mill.

A. S. De Forenede Papirfabrikkar of Copenhagen, Denmark, have under consideration the erection of a paper mill at Kjoge.

Der Gesellschaft fur Holzstoffbersitung, in Basel, Switzerland, have decided to erect a ground wood pulp mill in France.

The Spanish paper manufacturers have decided to decrease the production of their mills, owing to overproduction and low prices, and have opened a joint sales office in Madrid from whence the orders are distributed to the different mills.

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A Bill introduced by Senator Belcourt for the prevention of pollution of navigable waters, which will affect those paper manufacturing firms which discharge their effluent into streams of this character, was passed by the Senate last week. It provides that anyone is guilty of an indictable offence who allows to flow into navigable water or water which flows into navigable water, any sewage matter or any solid or liquid matter which, not being sewage, is poisonous, noxious, putrid, decomposing, refuse or waste; unless such matter is disposed of in accordance with regulations or orders made or permits granted. A penalty of $500 and $50 per day is provided.

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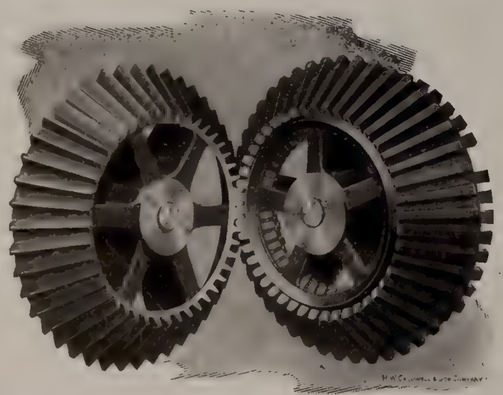

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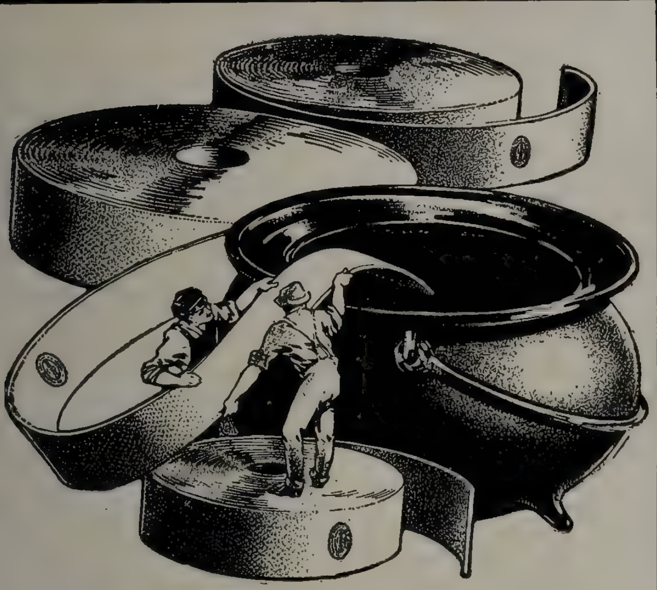

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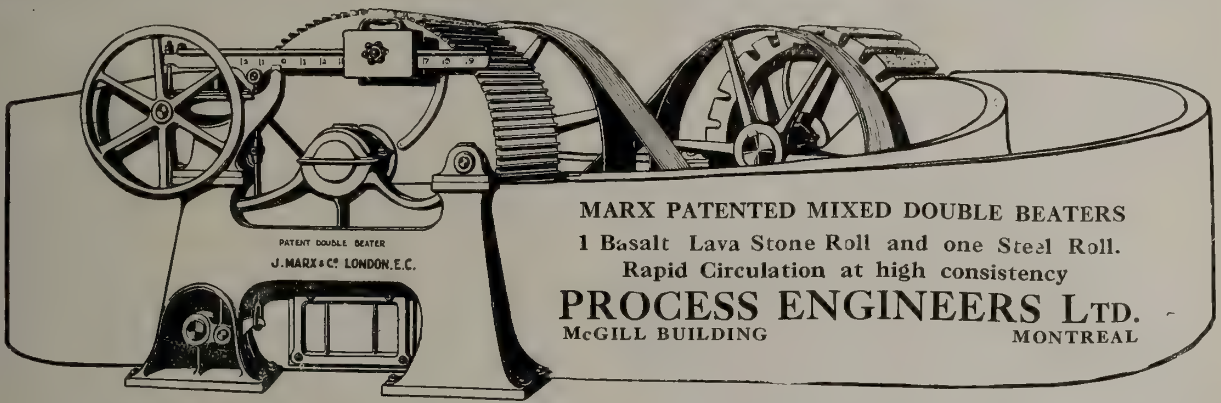

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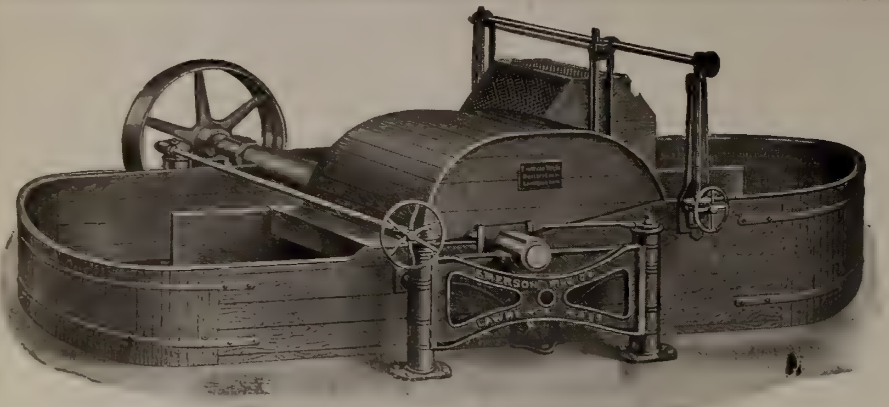

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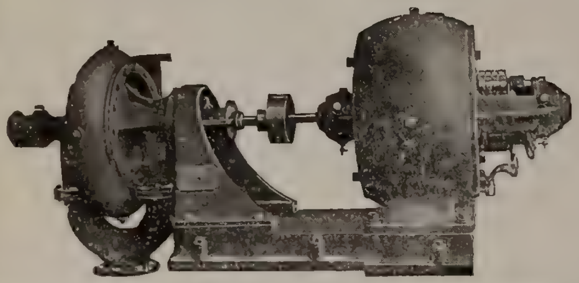

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Write for Samples and Prices.

INDEX TO MILL SUPPLIES

This Directory is published to facilitate the work of our readers, in the mills. If the information sought is not found, an invitation is extended to communicate with the editor, who will gladly be of all assistance possible.

Air Hoists
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Bags.
Smart-Woods Ltd , Montreal, Que.
Barkers
Boving & Co. of Canada, Limited.
Carthage Machine Co., Carthage, N.Y.
Canadian Barker Co., Ltd., Sault Ste. Marie, Can.
Green Bay Barker Co., Green Bay, Wis.
Hamilton, Wm., Co., Peterboro, Can.
Jenckes Machine Co., Sherbrooke, Que.
Waterous Engine Works Co. Ltd., Brantford, Can.
Valley Iron Works, Appleton, Wis.
Voith, J. M. Co., Inc., New York, N.Y.
Beaters
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Mach. Co., Lawrence, Mass.
Emerson Mfg. Co., Lawrence, Mass.
Jones, E. D. & Sons Co., Pittsfield, Mass.
Marx & Co., J., London, England.
Process Engineers, Ltd., Montreal, Canada.
Voith, J. M. Co., Inc., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford, Can.
Tippet Arthur P. & Co., Montreal. Can.
Belting
Can. Fairbanks-Morse Co., Ltd., Montreal, Canada
Capital Wire Cloth and Manufacturing Co. Ltd., Ottawa, Ont.
Dominion Belting Co., Hamilton, Can.
Federal Engineering Co., Ltd., Montreal, Que.
Federal Engineering Co., Toronto, Ont.
Manhattan Rubber Mfg. Co., Passaic, N.J.
Reddaway, F. & Co., Montreal, Can.
Bleaching Powders
Brunner, Mond & Co., Montreal, Can.
Hooker Electrochemical Co., Wall St., New York, N.Y.
Klipstein, A. & Co., Ltd., Montreal, Can.
Winn & Holland, Montreal, Can.
Bleaching Machinery
Boving & Co., of Canada, Limited, Toronto, Ont.
Blowers
Sherbrooke Mach. Co., Sherbrooke, Que.
Boilers
Canadian Allis-Chalmers, Ltd., Toronto
Jenckes Machine Co., Sherbrooke, Que.
MacDougall, J., Caledonian Iron Works, Montreal, Can.
Waterous Engine Works Co. Ltd., Brantford, Can
Brass Wire Cloth, Fourdrinier Wires
Capital Wire Cloth and Mfg., Co., Ltd., Ottawa, Ont.
Christie, Geo., Ltd., Glasgow, Scotland.
Johnson, C. H. & Sons, St. Henry, Montreal, Can.
Taylor, James, St. Francois Xavier Street, Montreal, Can.
Tippet, A. P. & Co., Montreal, Can.
United Wire Works, Edinburgh, Scotland.
Westbye, P. P., Peterboro, Can.
Calender Rolls
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Machine Co., Lawrence, Mass.
Farrell Foundry & Mach. Co., Ansonia, Conn.
Camel Hair Belting
Reddaway, F. & Co., Montreal, Can.
Carriers
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Case Slings
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Causticising Systems
Boving & Co., of Canada, Limited, Toronto, Ont.
Chemicals, Colors, Etc.
Brunner, Mond & Co., Montreal, Can.
Gewerkschaft Sachtleben, Homberg, Niederrheim, Germany.
Klipstein, A. & Co., Montreal, Can.
Hooker Electrochemical Co., New York, N.Y.
Paper Makers' Chemical Co., Easton, Pa.
Tippet A. P. & Co., Montreal, Can. .
Wilson-Paterson Co., Board of Trade Bldg., Montreal, Can.
Winn & Holland, Montreal, Can.
Chain Crane
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Chain Blocks
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Chain Clutches
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Chain Slings
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
China Clay
China Clay Co., Manchester, England.
Klipstein, A. & Co., St. Peter Street, Montreal, Can.
Paper Makers' Chemical Co., Easton, Pa.
Wilson-Paterson Co., Board of Trade Bldg., Montreal, Can.
Chippers
Boving & Co., of Canada, Limited, Toronto. Ont.
Carthage Machine Co., Carthage, N.Y.
Valley Iron Works, Appleton, Wis.
Chip Screens
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Cranes
Boving & Co. of Canada, Limited, Toronto, Ont.
Hamilton, Wm. Co., Ltd., Peterboro, Can.
Northern Crane Works, Ltd., Walkerville, Ont.
Smart-Turner Mach. Co., Hamilton, Ont.
Coal Handling Machinery
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Cranes—Gantry
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Cranes—Hand Power
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Cranes—Overhead Travelling
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Cranes—Post Jil
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Cranes—Wall
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Conveying Machinery
Caldwell, H. W. & Son Co., Chicago, Ill.
Jeffrey Mfg Co., Montreal, Can.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Couch Rolls
Bertrams Ltd., Edinburgh, Scotland.
Chambers Ltd., 152 Bay Street, Toronto.
Sherbrooke Mach. Co Ltd., Sherbrooke, Q
Cylinders
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co. of Canada, Limited, Toronto, Ont
Chambers Ltd., 152 Bay Street, Toronto.
Sherbrooke Machinery Co., Sherbrooke, Que.
Cutters
Bertrams Ltd., Edidburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Machine Co., Lawrence, Mass.
Cylinder Covers
Boving & Co., of Canada, Limited, Toronto, Ont.
Johnson, C. H. & Sons, Ltd., St. Henry, Montreal, Que.
Kufferath, Andreas, Mariaweiler, Germany.
Cylinder Moulds
Bertrams Ltd., Edinburgh, Scotland.
Chambers Ltd., 152, Bay Street, Toronto.
Sherbrooke Machinery Co., Sherbrooke, Que,
Cylinder Rolls
Capital Wire Cloth and Manufacturing Co. Ltd., Ottawa, Ont.
Dandy Rolls
Capital Wire Cloth and Manufacturing Co. Ltd., Ottawa, Ont
Chambers Ltd., 152 Bay Street, Toronto.
Johnson & Sons, C. H., St. Henry, Montreal, Can.
Marshall, T. J. & Co., Ltd., London, Eng.
Digester Lining
Boving & Co., of Canada, Limited, Toronto, Ont.
Panzl Digester Lining Co., Muskegon, Mich.
Preston's Digester Lining Co., Radcliffe, Eng.
Stebbins Eng. & Mfg. Co., Watertown, N.Y.
Digesters
Boving & Co., of Canada, Limited, Toronto, Ont.
Digester Gauges
Schaeffer & Budenberg, Brooklyn, N.Y.
Drainer Bottoms
Snell, Samuel, Co., Holyoke, Mass
Dryers
Bertram Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Electric Cranes
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Elevating and Conveying Machinery
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Evaporators
Boving & Co., of Canada, Limited, Toronto, Ont
Process Engineers, Ltd., Montreal, Canada.
Scott, Ernest & Co., Fall River, Mass.
Exhausters
The Sherbrooke Machinery Co., Sherbrooke, Que.
Experimental Machinery
Chambers Ltd., 152 Bay Street, Toronto.
Marshall, T. J. & Co., Ltd., London, Eng.
Process Enginners Ltd., Montreal, Can.
Exporters
Parsons Trading Co., New Tork, N.Y.
Felts
Ayers, Ltd., Lachute Mills, Que.
Bates & Innes, Ltd., Carleton Place, Ont.
Bredt, F. & Co., New York, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Dallyn, Jardine & Co., Toronto, Can.
Heimbach, Thos. Jos., Ltd., Duren, Germany.
Huyck, F. C., Albany, N.Y.
Johnson, C. H. & Sons, St. Henry, Montreal, Can.
Penmans, Ltd., St. Hyacinthe, Can.
Porritt, Joseph & Sons, -Manchester, Eng.
Spencer, J. H. & Sons, Bury, England. .
Tippett Arthur P. & Co., Montreal. Can.
Filters
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Norwood Engineering Co. of Canada, Ltd., Cowansville, P.Q.
Fourdriniers Wires
(See Brass Wire Cloth.)
Friction Hoists
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Gauges
Sc haeffer & Budenberg,Brooklyn, N.Y.
Generators and Transformers
Chambers Ltd., 152 Bay Street, Toronto.
Siemens Co., of Canada, Ltd., Montreal, Can.
Gravity Lowering Blocks
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Grinders
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Glens Falls Mach. Works, Glens Falls, N.Y.
Hamilton, Wm., Co., Peterboro, Can.
Jenckes Machine Co., Sherbrooke, Que.
Voith, J. M. Co., Inc., New York, N.Y.
Voith, J. M., Wurtemberg, Germany.
Waterous Engine Works Co. Ltd., Bran

MILL SUPPLIES---Continued

Heating
- Sheldons, Ltd., Galt, Ont.

Hand Hoists
- Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Hoists.
- Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Northern Crane Works Limited, Walkerville, Ont

Hoists—Chain Electric and Pneumatic
- Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Jordan Engines
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Jones, E. D. & Co., Pittsfield, Mass.
- Process Engineers, Ltd., Montreal, Canada.

Knives
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Chambers Ltd., 152 Bay Street, Toronto.
- Crookes, Roberts & Co., Sheffield, Eng.
- Hay, Peter, Knife Co., Galt, Can.
- Tippet, A. P. & Co., Montreal, Can.

Kollergangs
- Bertrams Ltd., Edinburgh, Scotland.
- Boving & Co., of Canada, Limited, Toronto, Ont
- Chambers Ltd., 152 Bay Street, Toronto.

Laying Machines
- Chambers, Ltd., Toronto.
- Collis & Sons, J, London, Eng.

Motor
- Chambers Ltd., 152 Bay Street, Toronto.
- Siemens Co. of Canada, Ltd., Montreal, Can.

Packings
- Canadian Consolidated Rubber Co., Montreal, Can.

Presses
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Can. Boomer & Boschert Press Co., Montreal, Can.
- Chambers Ltd., 152 Bay Street, Toronto.

Paper Stock, Etc.
- Hough, R., London, England.
- Pullan, E., 490 Adelaide Street, W., Toronto, Can.
- Walker, J. R., & Co., 35 Common Street, Montreal, Can.

Paper and Pulp Machinery
- Beloit Iron Works, Beloit, Wis.
- Bentley & Jackson, Bury, England.
- Bertram, James & Son, Ltd., Edinburgh, Scotland.
- Bertram's, Ltd., Edinburgh, Scotland.
- Black-Clawson Co., Hamilton, Ohio.
- Canadian Boomer & Boschert Press Co., Ltd., Montreal.
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Carthage Machine Co., Carthage, N.Y.
- Chambers Ltd., 152 Bay Street, Toronto, Can.
- Dillon Machine Co., Lawrence, Mass.
- Emerson Mfg. Co., Lawrence, Mass.
- Farrell Foundry & Mach. Co., Ansonia, Conn.
- Fullner, H., Warmbrunn, Germany.
- Glens Falls Machine Works, Glens Falls, N.Y.
- Green Bay Barker Co., Green Bay, Wis.
- Hamilton, Wm., Co., Peterboro, Can.
- Harmon Machine Co., Watertown, N.Y.
- Jenckes Machine Co., Sherbrooke, Que.
- Jones, E. D. & Sons Co., Pittsfield, Mass.
- Johnson, C. H. & Sons, Ltd., Montreal, Can.
- Marx, J. & Co. London, E.C., England.
- Moore & White Co., Philadelphia, Pa.
- Process Engineers, Ltd., Montreal, Canada.
- Rice, Barton & Fales .Worcester, Mass.
- Sandy Hill Iron & Brass Works, Hudson Falls, N.Y
- Scott, Ernest & Co., Fall River, Mass.
- Sheldons, Ltd., Galt, Can.
- Sherbrooke Mach. Co., Ltd., Sherbrooke, Can.
- Smith, S. Morgan, Co., York, Pa.
- Stebbins Eng. & Mfg. Co., Watertown, N.Y.
- Ticonderoga Machine Works, Ticonderoga, N.Y.
- Valley Iron Works, Appleton, Wis.
- Voith, J. M., New York, N.Y.
- Voith, J. M., Wurtemberg, Germany.
- Walmsley, Chas. & Co., Bury, Eng.
- Waterous Engine Works Co., Ltd., Brantford, Can.
- Westbye, P. P., Peterboro, Can.

Paper Machine Tachomoters
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Schaeffer & Budenberg, Brooklyn, N.Y.

Paper Tester
- Chambers Ltd., 152 Bay Street, Toronto.
- Marshall. T. J. & Co., Stoke Newington, London. England.

Pneumatic Thickeners
- Sherbrooke Mach. Co., Ltd , Sherbrooke, Que.

Pneumatic Chain Blocks
- Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Press Rolls
- Bertrams Ltd., Edinburgh, Scotland.
- Chambers Ltd., 152 Bay Street, Toronto.
- Sherbroke Mach. Co Ltd., Sherbroke, Que.

Press Wire Cloth.
- Chambers Ltd., 152 Bay Street, Toronto.
- Kufferath, Andreas, Mariaweiler, Germany.

Pulp Stones
- Stancliffe Estates Co., Ltd., Darley Dale, England.

Pumps
- Bertrams Ltd., Edinburgh, Scotland.
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Canadian Allis-Chalmers, Ltd., Toronto, Ont.
- Carthage Machine Co., Carthage, N.Y.
- Chambers Ltd., 152 Bay Street, Toronto.
- Dillon Machine Co., Lawrence, Mass.
- Glen Falls Machine Works, Glens Falls, N.Y.
- Hamilton, Wm., Co., Peterboro, Can.
- Lawrence Machine Co., Lawrence, Mass.
- Lawrence Pump & Engine Co., Lawrence. Mass.
- Smart-Turner Machine Co., Hamilton, Can.
- Sherbrooke Mach. Co., Ltd , Sherbrooke, Que.
- Voith, J. M., New York, N.Y.

Rags
- Walker, J. R. & Co., Montreal, Can.

Recording Gauges
- Schaeffer & Budenberg, Brooklyn, N.Y.

Recording Thermometers
- Schaeffer & Budenberg, Brooklyn, N.Y

Refiners
- Bertrams Ltd., Edinburgh, Scotland.
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Chambers Ltd., 152 Bay Street, Toronto.
- Marx, J. & Co., London, E.C., England.
- Process Engineers, Ltd., Montreal, Canada.
- Rice, Barton & Falls Mach. & Iron Co., Worcester, Mass.
- Voith, J. M., New York, N.Y.
- Waterous Engine Works Co. Ltd., Brantford, Can.

Rope Blocks
- Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Rosin Size
- Fox, Stockell & Co., London, Eng.
- Paper Makers Chemical Co., Easton, Pa.
- Process Engineers, Ltd., Montreal, Canada.
- Vera Chemical Co., North Milwaukee, Wis.
- Wilson-Paterson Co., Board of Trade Bldg., Montreal, Can.

Rosin Size Boilers and Dissolvers
- Boving & Co., of Canada, Limited, Toronto, Ont.

Rotary Sulphur Furnaces
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Canadian Pulp Mill Machinery Co., Montreal, Can.
- Stebbins Engineering and Manufacturing Co., Watertown, N.Y

Runways—Hand operated
- Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Save-Alls
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
- Waterous Engine Works Co., Ltd., Brantford, Can.

Self Landing, Self Delivery Hoists
- Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Screen Plates
- Bertrams Ltd., Edinburgh, Scotland.
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Chambers Ltd., 152 Bay Street, Toronto.

Screens
- Bertrams Ltd., Edinburgh, Scotland.
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Chambers Ltd., 152 Bay Street. Toronto.
- Glens Falls Mach. Wks., Glens Falls, N Y
- Harmon Machine Co., Watertown, N.Y.
- Jenckes Machine Co., Sherbrooke, Que.
- Johnson, Chas., St. Henry, Que.
- Marx & Co., J., London, England.
- Process Engineers, Ltd., Montreal, Canada.
- Sherbrooke Mach. Co. Ltd. Sherbrooke, Que
- Tippet Arthur P. & Co., Montreal, Cau.
- Voith, J. M., New York, N.Y.
- Voith, J. M., Wurtemberg, Germany.
- Waterous Engine Works Co. Ltd., Brantford, Can.
- Westbye, P. P., Peterboro, Can.

Shear Legs
- Morris, Herbert, Hoist & Crane Co., Toronto, Ont.

Slings
- Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Slitters and Re-Winders
- Bertrams Ltd., Edinburgh, Scotland.
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Cameron Machine Co., Brooklyn, N.Y.
- Chambers Ltd., 152 Bay Street, Toronto.
- Moore & White Co., Philadelphia, Pa.
- Ticonderoga Machine Works, Ticonderoga, N.Y.

Smelting Furnaces
- Boving & Co., of Canada, Limited, Toronto, Ont.

Straw Cutters'
- Bertrams Ltd., Edinburgh, Scotland.
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Chambers Ltd., 152 Bay Street, Toronto.

Straw Dusters
- Bertrams Ltd., Edinburgh, Scotland.
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Chambers Ltd., 152 Bay Street, Toronto.

Straw Digesters
- Boving & Co., of Canada, Limited, Toronto, Ont.

Strawboard Making Machines
- Bertrams Ltd., Edinburgh, Scotland.
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Chambers Ltd., 152 Bay Street, Toronto.

Steam Regulator
- Pickles, W. F., Buckland, Conn.

Stuff Chests
- Boving & Co., of Canada, Limited, Toronto, Ont.

Sulphite Mill Equipment
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Stebbins Engineeringand Manufacturing Co., Watertown, N.Y

Sulphate Mill Equipment
- Boving & Co., of Canada, Limited, Toronto, Ont.

Sulphur
- Union Sulphur Co., 17 Battery Place, New York, N.Y.

Sulphur Burners
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Glens Falls Machine Works, Glens Falls, N.Y.
- Stebbins Engineering and Manufacturing Co. Watertown, N.

Tachometers (Hand and Stationary)
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Schaeffer & Budenberg, Brooklyn, N.Y.

Track Systems
- Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Tanks
- Canadian Allis-Chalmers, Ltd., Toronto, Ont.
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Hamilton, Wm, Co., Peterboro, Can.
- Jenckes Machine Co., Sherbrooke, Que.
- McDougall, John, Caledonian Iron Works, Montreal, Can

Thermometers
- Schaeffer & Budenberg, Brooklyn, N.Y.

Transmission Machinery
- Caldwell, H. W. & Son Co., Chicago, Ill.
- Canadian Allis-Chalmers, Limited, Toronto.
- Boving & Co., of Canada, Limited, Toronto
- Jones & Glassco, Montreal, Can.

Traveling Cranes
- Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Trolleys
- Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

MILL SUPPLIES---Continued

Turbines
- Boving & Co., of Canada, Toronto, Ont.
- Canadian Allis-Chalmers, Ltd., Toronto, Ont.
- Smith, S. Morgan Co., York, Pa.
- Voith, J. M. Co., Inc. New York, N.Y.
- Voith, J. M., Wurtemberg, Germany.

Water Wheels
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Canadian Allis-Chalmers, Ltd., Toronto, Ont.
- Hamilton, Wm. Co., Ltd., Peterboro, Can.
- Smith, S. Morgan Co., York, Pa.
- Voith, J. M., New York, N.Y.

Wire Cloth for Paper Machines
- Chambers, Ltd., Toronto.
- Christie, Geo., Ltd., Glasgow, Scotland.
- Johnson, C. H. & Sons, Ltd., St. Henry, Montreal, Que
- Kufferath, Andreas, Mariaweiler, Germany.
- Tippet, Arthur P. & Co., Montreal, Can.
- Taylor, J. A., Montreal, Can.
- United Wire Works, Ltd., Edinburgh, Scotland.
- Westbye, P. P., Peterboro, Can.

Waste
- Hough, R., London, England.

Wet Machines
- Bertrams Ltd., Edinburgh, Scotland.
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Carthage Machine Co., Carthage, N.Y.
- Chambers Ltd., 152 Bay Street, Toronto.
- Glens Falls Machine Works, Glens Falls, N.Y.
- Hamilton, Wm. Co., Peterboro, Can.
- Norwood Engineering Co. of Canada, Ltd., Cowansville, P.Q.
- Process Engineers, Ltd., Montreal, Canada.
- Sherbrooke Machinery Co., Sherbrooke, Can.
- Voith, J. M., New York, N.Y.
- Waterous Engine Works Co. Ltd., Brantford Ont.

PULP AND PAPER MILL PRODUCTS

This aims to be a complete list of the products of Canadian Pulp and Paper Mills, who are urged to send us lists of brands and watermarks, as well as the headings under which they wish to be indexed. Buyers who cannot meet their requirements from this list, are invited to communicate with the editor, who is in close touch with the mills, and will gladly furnish full information.

PULP MILLS

Ground Wood Pulp
- Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
- Basin Electric Light & Power Co., Ltd., Montmagny, Que.
- Beaver Co. Ltd., Thorold, Ont.
- Belgo-Canadian Pulp & Paper Co., Shawinigan Falls, Que.
- Brompton Pulp & Paper Co., Brompton and E. Angus, Que.
- Booth, J. R. Ottawa, Ont.
- Bronson Co., Ltd., Ottawa, Ont.
- Clyde River Pulp & Paper Co., Ltd., Liverpool, N.S.
- Colonial Wood Products Co., Ltd., Thorold, Ont.
- Campbell Lumber Co., Weymouth, N.S.
- Canada Paper Co., Ltd., Montreal, Que.
- Chicoutimi Pulp Co., Chicoutimi, Que.
- Compagnie de Pulpe de Dalmas, Dalmas, Que.
- Davy, James, Thorold, Ont.
- Eddy Co., The E. B., Ltd., Hull, Que.
- East Canada Power & Pulp Co., Ltd., Nairn Falls, Que.
- Foley-Rieger Pulp & Paper Co., Ltd., Thorold, Ont.
- Ford, J. & Co., Port Neuf, Que.
- Jacques-Cartier Pulp & Paper Co., Montreal.
- Jonquiere Pulp Co., Ltd., Jonquiere, Que.
- La Cie de Metabetchouan, St. Andre, Que.
- La Havre Pulp Co., Ltd., Bridgewater, N.S.
- Lake Megantic Pulp Co., Lake Megantic, Que.
- Laurentide Co., Ltd., Grand Mere, Que.
- MacLaren Co., Ltd., The James, Buckingham, Que.
- McLeod Pulp Co., Ltd., Liverpool, N.S.
- News Pulp & Paper Co., Ltd., St. Raymond, Que.
- Nicolet Falls Pulp & Lumber Co., Nicolet Falls, Que.
- North Shore Power, Railway & Navigation Co., Clarke City.
- Northumberland Paper & Electric Co., Campbellford, Ont.
- Nova Scotia Wood & Pulp Co., Ltd., Mill Village, N.S.
- Ontario Paper Company, Thorold, Ont.
- Ouiatchouan Falls Paper Co., Ouiatchouan Falls, Que.
- Powell River Co., Ltd., Powell River, B.C.
- Price Bros. & Co., Ltd., Kenogami, Que'
- Price-Porritt Pulp & Paper Co., Rimouski, Que.
- Reed, A. E. & Co., (Nfld.), Ltd., Bishop's Falls, Nfld.
- River-du-Loup Pulp Co., Ltd., Fraserville, Que.
- Soucy, F. Florentine, Old Lake Road, Que.
- Spanish River Pulp and Paper Mills, Ltd., Espanola, Ont., Sturgeon Falls, Ont., Toronto, Ont., and Sault Ste. Marie, Ont.
- St. George Pulp and Paper Co., St. George, N.B.
- Thorold Pulp Co., Ltd., Thorold, Ont.
- Trent River Paper Co., Ltd., Frankford, Ont.
- Union Bag & Paper Co., Cape Madeleine, Que.
- Trent Valley Paper Mills, Glenmiller, Ont.
- Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Q

Kraft
- Brompton Pulp & Paper Co., East Angus, Que.
- Dryden Timber and Power Co., Dryden, Ont.
- New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
- Quebec and St. Maurice Industrial Co., La Tuque, Que.
- Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que

Soda Fibre
- Canada Paper Co., Ltd., Montreal and Toronto.
- Dominion Paper Co., Montreal, Que.
- Provincial Paper Mills Co., Ltd., Toronto, Ont.

Sulphite Fibre
- Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
- British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
- Booth, J. R., Ottawa, Ont.
- Dominion Pulp Co., Ltd., Chatham, N.B.
- Edward Partington Pulp & Paper Co., Ltd., St. John, N.B.
- Eddy Co., The E. B., Ltd., Hull, Que.
- Jonquiere Pulp Co., Ltd., Jonquiere, Que.
- Laurentide Co., Ltd., Grand Mere, Que.
- Lake Superior Paper Co., Ltd., Sault Ste. Marie, Ont.
- Powell River Co., Ltd., Powell River, B.C.
- Price Bros. & Co., Ltd., Kenogami, Que.
- Riordan Pulp & Paper Co., Ltd., Montreal, Que.
- Spanish River Pulp and Paper Mills Ltd., Sturgeon Falls, Ont., and Sault Ste. Marie, Ont.
- Swanson Bay Forests, Wood, Pulp & Lumber Mills, Ltd., Swanson, Bay, B.C.
- Toronto Paper Mfg. Co., Ltd., Cornwall, Ont.

PAPER MILLS

Bag
- Eddy, The E. B. Co., Ltd., Hull, P. Q.
- Lincoln Paper Mills Co., Ltd., Merritton, Ont.
- Ford, J. & Co., Port Neuf.
- Wilson, Ltd., J. C., 61 St. Alexander Street, Montreal, Que.
- Jonquiere Pulp Co., Jonquiere, Que.

Binders' Board
- McArthur, Alex. & Co., Montreal.
- Northumberland Paper and Electric Co., Campbellford, Ont.

Blotting
- Canada Paper Co., Montreal, Que., "Velvet Blotting."

Board
- See Wood Board and Cardboard Specials.

Bond
- Canada Paper Co., Ltd., Montreal, Que. "Burmese Bond," "St. Lawrence Bond," "Canada Bond," "Burmese Linen Ledger," "Windsor Mills Special," "Silverstream," "Springvale," "Super Writing," "White Railway," "Railway Manilla,"
- Howard Smith Paper Mills, Ltd., Montreal & Beauharnois, Que.
- Kinleith Paper Co., Ltd., St. Catharines, Ont.
- Rolland Paper Co., St. Jerome, Que., Mount Rolland, Que. and Montreal, Que.
- Provincial Paper Mills Co., Ltd., Toronto, Ont.
- Toronto Paper Mfg. Co., Cornwall, Ont.

Book and Litho
- Canada Paper Co., Ltd., Montreal, Que. "Art Photo Book," "Tinted Art Book," "Art Chromo," "English Book," "Satin Book," "Satin Litho," "Litho Label," "Super S. C. Book," "Standard S. C. Book," "Windsor Book."
- Eddy Co., The E. B., Ltd., Hull, Que.
- Kinleith Paper Co., Ltd., St. Catharines, Ont.
- Provincial Paper Mills Co., Ltd., Toronto, Ont.
- Toronto Paper Mfg. Co., Cornwall, Ont.

Box Board
- See Wood Board and Cardboard Special.

Dominion Timber Regulations

Licenses to cut timber on Dominion Lands in the Provinces of Manitoba, Saskatchewan, and Alberta, the Northwest Territories, within twenty miles on either side of the main line of the Canadian Pacific Railway in the Province of British Columbia, and in the tract of three and one-half million acres to be located by the Government of the Dominion in the Peace River district in the Province of British Columbia, lying east of the Rocky Mountains and adjoining the Province of Alberta, shall be disposed of by public auction at the office of the Dominion Timber Agent for the district in which the berths are situated.

Before any parcel of timber is offered for sale it shall be surveyed by a duly qualified Dominion Land Surveyor into berths of an area not exceeding twenty-five square miles, and each of such berths shall then be thoroughly cruised by a duly qualified timber cruiser in the employ of the Dominion Government. The Minister shall then fix an upset price at which the berth shall be disposed of, and no berth shall be sold at less than the price so fixed.

Purchases to the amount of one thousand dollars or under shall be paid in cash at the time of sale. Purchases over one thousand dollars and not exceeding five thousand dollars shall be paid, one-half in cash at the time of sale, and a note or notes shall be given for the remaining half of the purchase price, payable in three months, with interest at the rate of five per cent. per annum. Purchases over five thousand dollars and not exceeding ten thousand dollars shall be paid one-third in cash at the time of sale, and notes shall be given for the remaining two-thirds of the purchase price, payable in three and six months, with interest at the rate of five per cent. per annum. Purchases exceeding ten thousand dollars shall be paid one-fourth in cash at the time of sale, and notes shall be given for the remaining three-fourths of the purchase price, payable in three, six and nine months, with interest at the rate of five per cent. per annum. Notes shall be made payable at a bank in the city or town in which the sale is held or at a bank in the city of Ottawa. Cash payments must be made at the time of sale in legal tender or by an accepted cheque on a chartered bank, or by a draft issued by a chartered bank, payable to the order of the Deputy Minister of the Interior. If default is made in any payment required by this section the sale shall be forfeited and void.

The purchaser must also pay the cost or the estimated cost of the survey of the berth before a license is issued.

The licensee shall pay an annual ground rent of five dollars per square mile except for lands situated to the west of Yale, in the Province of British Columbia, in which case the yearly ground rent shall be five cents per acre.

The licensee shall pay the following dues on timber cut on his berth:—

Sawn lumber, 50 cents per thousand feet, board measure.

Railway ties, eight feet long, 1½ cents each.

Railway ties, nine feet long, 1¾ cents each.

Shingle bolts, 25 cents per cord.

And 5 per cent. on the sale of all other products of the berth.

Timber Permits

Yearly permits are granted to settlers, mine operators and others on application to the Dominion Timber Agents, from whom further information can be obtained.

W. W. Cory,
Deputy Minister.

Department of the Interior, Ottawa,
December 20th, 1912.

PAPER MILLS---Continued

Bristol

Don Valley Paper Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.
Canada Paper Co., Montreal & Toronto, "King Bristol," "Windsor Bristol," "C. P. S.Tinted Bristol," "Canada Bristol."

Building and Sheathing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que.
British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
Eastern Paper Co., Ltd., St. Basile, Que.
Montreal Paper Co., St. Basil, Que.
Northumberland Paper and Electric Co., Ltd., Montreal.
Riordon Pulp and Paper Co., Ltd., Montreal, Que.
Western Paper Mills, Ltd., Vancouver, B.C.
Jonquiere Pulp Co. Ltd., Jonquiere, Que.
Ford, R. & Son, Port Neuf, Que.
Laurentide Co., Ltd., Grand Mere, Que.
McArthur, Alex. & Co., Montreal, Que.
McLeod Pulp Co., Ltd., Liverpool, N.S.
Walker, J. R. & Co., Montreal, Que.

Cardboard Specials

Hinde & Dauche Paper Co., Ltd., Toronto, Ont.
Jonquiere Pulp Co., Jonquiere, Que.
Macleod Pulp Co., Ltd., Liverpool, N.S.
Canada Paper Co., Windsor Mills, Que. "Victor Printers' Blanks," "Superior Translucent Bristol," " C.P.C. Coated Litho," "Superfine Litho Blanks."
Booth, J. R., Ottawa, Ont.
Eddy, E. B. Co., Ltd., Hull, Que.
Laurentide Co. Ltd., Canada Life Building, Montreal, Que.

Carpet Lining

Ford, J. & Co., Port Neuf Station, Que.
Montreal Paper Co., St. Basile, Que.
Northumberland Paper & Electric Co., Ltd., Campbellford, Ont.
Wentworth Paper Mills, West Flamboro, Ont.
Western Paper Mills, Ltd., Vancouver, B.C.

Coated

Ritchie & Ramsay, Toronto, Ont.
Georgetown Coating Mills, Ltd., Georgetown, Ont.
National Paper Co., Valleyfield, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.

Corrugated Paper

Lazier Paper Mills, Ltd., Belleville.
Hinde & Dauche Paper Co., Ltd., Toronto, Ont.

Cover

Canada Paper Co., Ltd., Montreal and Toronto, "Tinted Art Cover," "Derby Cover," "Fibrestoc Cover," "Cashmere Cover," "X Cover," "XX Cover."
Eddy Co., The E. B. Ltd., Hull, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Ritchie & Ramsay, Toronto, Ont.

Envelope

Don Valley Paper Co., Ltd., Toronto.
Kinleith Paper Co., Ltd, St. Catherines, Ont.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Felts

Bird, F. W. & Sons, Hamilton, Ont., and Pont Rouge, Que.
Eastern Paper Co., Ltd., St. Basile, Que
McArthur, A. & Co., Montreal, Que.
Ford, J. & Co., Port Neuf, Que.
Ford, R. & Son, Port Neuf Station, Que.
Montreal Paper Co., St. Basile, Que.
Northumberland Paper & Electric Co., Ltd., Campbellford.
Western Paper Mills, Ltd., Vancouver, B.C.

Fibre

Canada Paper Co., Ltd., Montreal and Toronto.
Dominion Paper Co., Montreal, Que.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
McArthur, Alex. & Co., Montreal, Que.
Riordon Pulp and Paper Co., Merritton, Ont.
Strathcona Paper Co., Strathcona, Ont.
Wilson, Ltd., J. C., Montreal, Que.

Flour Sacks

Eddy Co., The E. B., Ltd., Hull, Que.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal.

Glazed

Provincial Paper Mills Co., Ltd., Toronto, Ont.

Hanging

Lincoln Paper Mills Co., Ltd., Merritton, Ont.
McArthur, Alex. & Co., Montreal, Que.
Moira Paper Mills, Belleville, Ont.
Riordon Pulp and Paper Co., Ltd., Montreal, Que.
Strathcona Paper Co., Strathcona, Ont.

Kraft

Brompton Pulp & Paper Co. Ltd., East Angus, Que.
Dominion Paper Co. Ltd., Montreal, Que.
Dryden Timber and Power Co. Ltd., Dryden, Ont.
New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que.

Leather Friction Board

Walker, J. R. & Co., Montreal, Que.

News

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
Belgo-Canadian Pulp and Paper Co., Shawinigan Falls, Que.
Booth, J. R., Ottawa, Ont.
Canada Paper Co., Ltd., Montreal and Toronto, "Canada Brand."
Eddy Co., The E. B., Ltd., Hull, Que.
Ford, Joseph & Co., Port Neuf, Que.
Fort Frances Pulp & Paper Co., Ltd., Fort Frances, Ont.
Jonquiere Pulp Co., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Lake Superior Paper Co., Sault Ste. Marie, Ont.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
McArthur, Alex. & Co., Montreal, Que.
Miller Bros. Co., Ltd., Glenmiller, Ont.
News Pulp & Paper Co., Ltd., St. Raymond, Que.
Powell River Co. Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que.
Riordon Pulp and Paper Co., Ltd., Montreal, Que
Spanish River Pulp & Paper Mills, Ltd., Toronto, Ont.
Ontario Paper Co., Thorold, Ont.

Roofing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que.
Ford, Joseph & Co., Port Neuf, Que.
Ford, Rowland and Son, Port Neuf, Que.
Montreal Paper Co., St. Bazile, Que.
Walker, J. R. & Co., 35 Common, Montreal, Que.
Western Paper Mills, Ltd., Vancouver, B.C.

Straw Board

Ford, J. & Co., Port Neuf, Qué.
Lazier Paper Mills, Ltd., Belleville.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
McArthur, A. & Co., Montreal, Que.
Moira Paper Mills, Belleville, Ont.
Northumberland Paper & Electric Co., Campbellford, Ont.
Trent River Paper Co., Ltd., Frankford, Ont.
Trent Valley Paper Mills, Glenmiller, Ont.

Tag

Don Valley Paper Co., Ltd., Toronto, Ont.
Eddy, The E. B. Co., Ltd., Hull, Que.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
J. R. Booth, Ottawa, Ont.

Tissue and Toilet

Eddy Co., The E. B., Ltd., Hull, Que.
Garden City Paper Mills, Ltd., St. Catharines, Ont.
Interlake Tissue Mills, Ltd., Merritton, Ont.
Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Que

Wall Board

Beaver Co., Ltd., Beaverdale, Que.
Bishoprick Wallboard Co., Ottawa, Ont.

Wood Board

Beaver Co. Ltd., Thorold, Ont.
Booth, J. R. Ottawa.
Brompton Pulps Paper Co. Ltd., East Angus, Que.
Canada Paper Co., Montreal, Que.
Eddy Co., The E. B., Ltd., Hull, Que.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Northumberland Paper & Electric Co., Campbellford, Ont.
McLeod Pulp Co., Liverpool, N.S.
Western Paper Mills, Ltd., Vancouver, B.C.
Wilson, J. C., Ltd., 61 St. Alexander St., Montreal Que

Wrapping

Booth, J. R., Ottawa, Ont.
Canada Paper Co., Ltd., Montreal and Toronto, "Scotch Fibre," "Invictus Fibre," Hercules Manilla," "St. Fancis Manilla," "Wave Crest Drug."
Dominion Paper Co., Montreal, Que.
Don Valley Paper Co., Ltd., Toronto, Ont.
Eddy Co., The E. B., Ltd., Hull, Que.
Ford, J. & Co., Port Neuf, Que.
Ford, Rowland, Port Neuf, Que.
Gore Valley Paper Mills, Dundas, Ont.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Canada Paper Co., Monreal and Toronto.
See also Kraft.

Writing

Howard Smith Paper Mills Ltd., Beauharnois, Que.
Kinleith Paper Co., St. Catherines, Ont.
Rolland Paper Co., Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Manufacturing Co., Cornwall, Ont.

THE PROVINCE OF ONTARIO

is rich in timber, mineral, agricultural, and other resources.

Ontario has large areas of White Pine and other valuable timbers, her timber products last year representing one-third of the total output of Canada.

Ontario has pulpwood areas practically illimitable, and offers a great field for those desirous of embarking in the pulp and paper-making industry.

Ontario has innumerable waterfalls capable of supplying power for all manufacturing purposes, which are obtainable on reasonable terms, subject to development.

Ontario has large pulp and paper mills in operation at Ottawa, Sturgeon Falls, Spanish River Sault Ste. Marie and Dryden and large plants are under construction at Abitibi on the Temiskaming and Northern Ontario Railway, and Fort Frances on the Rainy River.

Ontario is traversed East and West by three great transcontinental railways, and North and South by three others.

For full particulars as to Ontario's great resources and the advantages offered for large wood-using industries apply to

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Minister of Lands, Forests and Mines
Toronto

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John Martin Paper Co., Ltd.
Tees & Persse.

Edmonton, Alta.
Tees & Persse.
John Martin Paper Co., Ltd.

Saskatoon, Alta.
Tees & Persse.

Vancouver, B.C.
Brake, Creedon Co., Ltd.
Mitchell Bros., 123 Cordova E.
Smith, Davidson & Wright.

Victoria, B.C.
Mitchell Bros., 8 Bastion.

Moose Jaw, Sask.
Tees & Persse.

Regina, Sask.
Tees & Persse.

Winnipeg, Man.
Barber & Ellis
Clark Bros. & Co., Ltd., 143 Portage.
Ratcliffe Paper Co., Ltd.
Hudson Paper Co.
Kilgour Bros.
Martin, John, Paper Co., Ltd., 319 William.
McAllister & Watts.
McFarlane, Son & Hodgson, Bannatyne and Adelaide.
Tees & Persse.
John Martin Paper Co., Ltd.

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Schofield Paper Co., Ltd., 26-30 Prince William.

Moncton, N.B.
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Eastern Supply & Paper Co., 28 Bedford Row.
Latter, N., 104½ Windsor.
Allen, T. C. & Co.

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McGregor, R. & Co.

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Hendry, J. A., 875 Princess.

Hamilton, Ont.
Buntin, Gillies & Co., Ltd., John and Jackson.
Powis, A., 64 King E.

Ottawa, Ont.
Barnard, W. R., 374 Bank St.
Reid, C. De Wolf.

Port Arthur, Ont.
Tees & Persse.

Toronto, Ont.
Barber-Ellis Co., Ltd., 71 Wellington Street, W.
Brown Bros., Ltd., 51 Wellington Street, W.
Buntin, Reid Co., 13 Colborne.
Canada Paper Co., Ltd., 112 Bay Street.
Ratcliffe Paper Co., Ltd.
Fisher, E. W., 215 Victoria.
Gaine, T. & Son, 124 Richmond W.
Gage, W. J. Co., Ltd., 84 Spadina Ave.
Hodge-Sheriff Paper Co., McKinnon Building.
Howell, G. A. Co., 10 Wellington E.
Livingstone, H. E. & Co., 80 George.
McNairn, J. H., 5 Jarvis.
Thorne, A. M. & Co., 45 Colborne Street
Victoria Paper & Twine Co., Ltd., 415 King W.
Waters Bros., 33 Front E.
Whyte, Alex., 64 Wellington Street, W.
Wilkinson, E. H., Telephone Building.

Montreal, Que.
Dawson, W. V. & Co., 17 De Bresoles.
Dickinson, John & Co., Ltd., 216 Lemoine.
Little, T. B. & Co., 23 Cote.
Lloyd, Ed., Ltd., Eastern Townships Bank Building
McFarlane, Son & Hodgson, 14 St. Alexander.
Reid, C. DeWolf, Herald Bldg.
Robertson & Parker, St. Paul.
Rolland, J. B. & Son, 14 St. Vincent.
Smith, Howard, Paper Mills, Ltd., 138 McGill.

Quebec, Que.
Andrews, F. H. & Son, 64 St. Paul.
Rolland, J. B. & Son, 36 St. Paul.

Foreign
Salomon & Co., Felix, New York City,
Whitaker Paper Co., Cincinnati, Ohio.
Castle, Gotheil & Overton, New York, N.Y.
Churchill & Sim, Clements Lane, London, E.C., Eng.
Parsons Trading Co., 1 Battery Place, New York.
Pulp and Paper Trading Co., Temple Court Building, New York.
Scandinavian American Trading Co., New York, N.Y.

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CHEMIST wants position with reliable company in investigation or control work. Understands pulp and paper manufacture. Five years' experience. Technical and engineering training. Any location. In replying give details as to requirements. Address, Paper Chemist, Pulp and Paper Magazine, Montreal.

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SCANDINAVIA BELTING
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2500-5000 Ampere Units. Licenses Granted,
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TRY ONE—IT WILL GIVE YOU A LINE ON THEM ALL.
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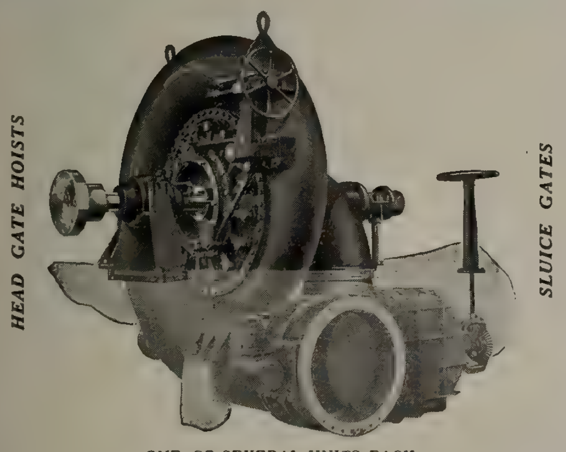

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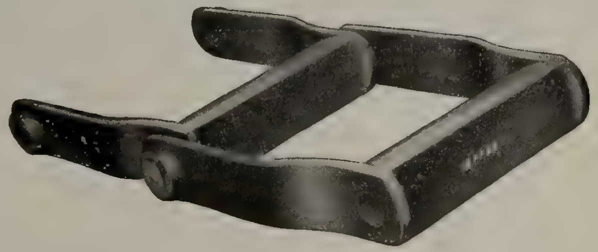

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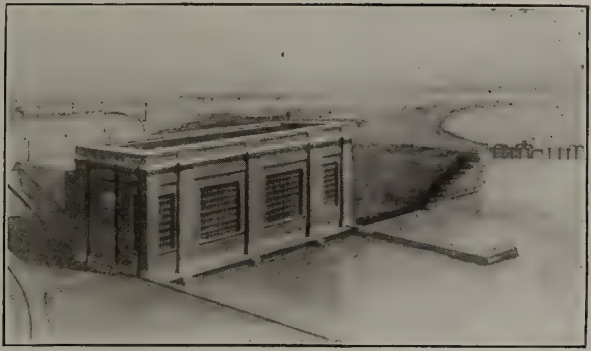

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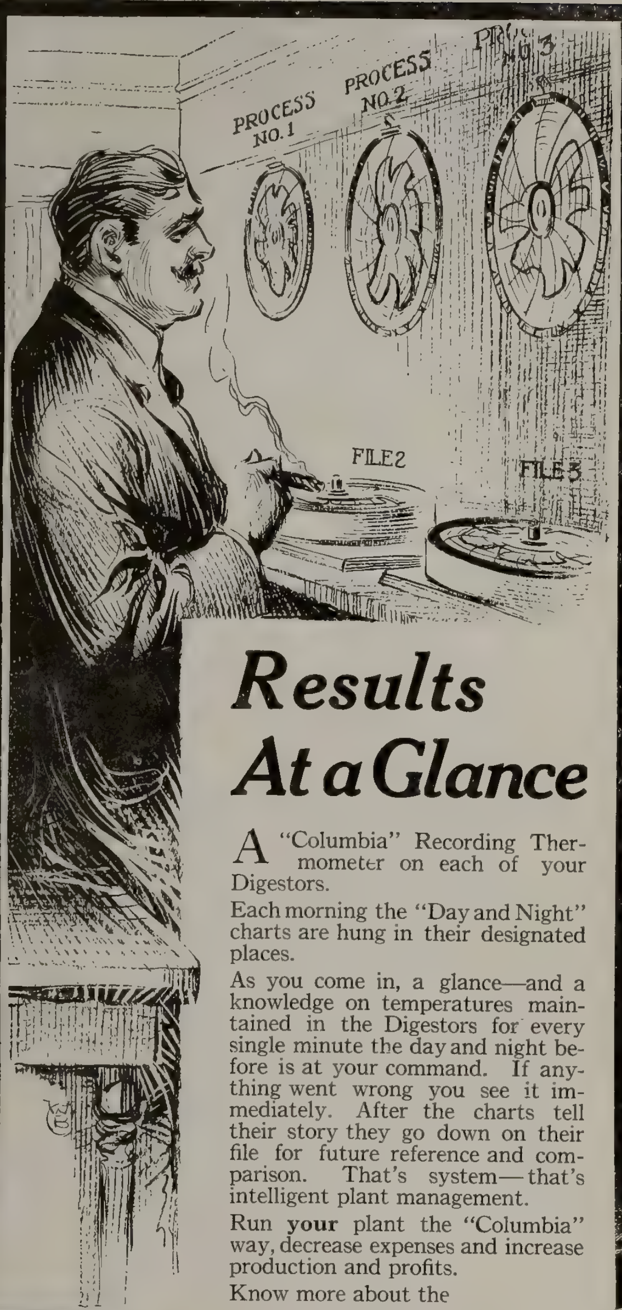

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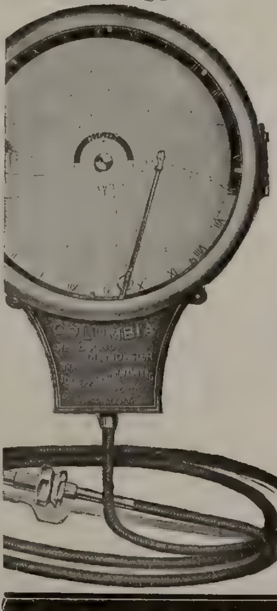

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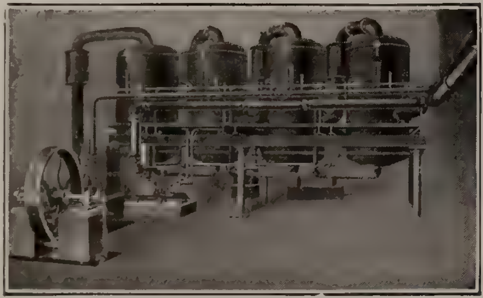

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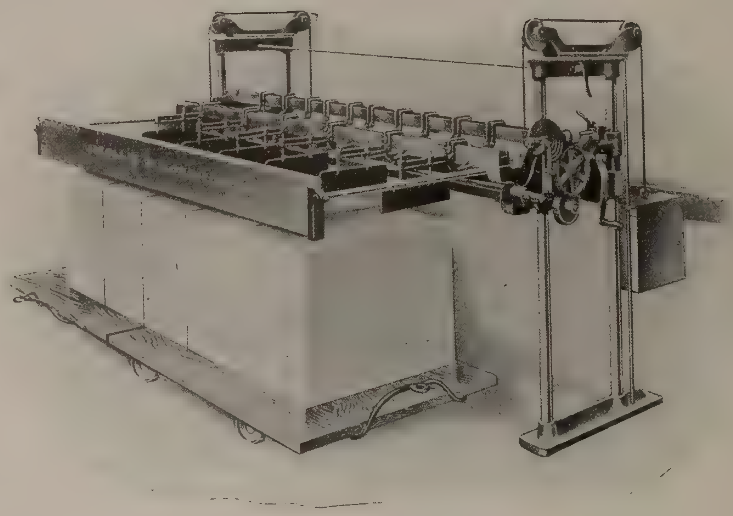

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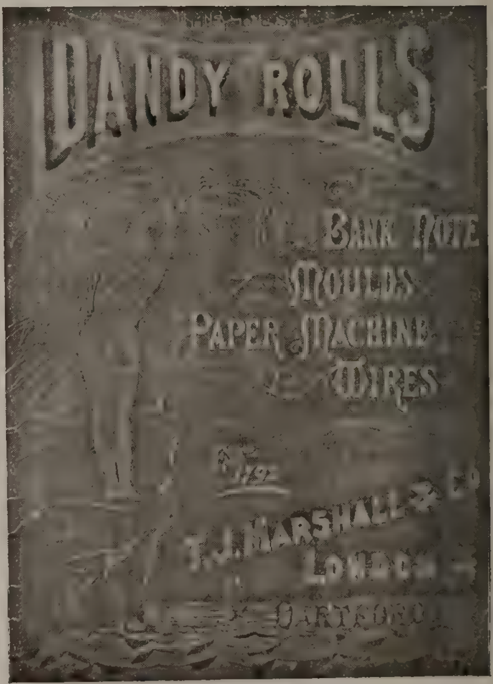

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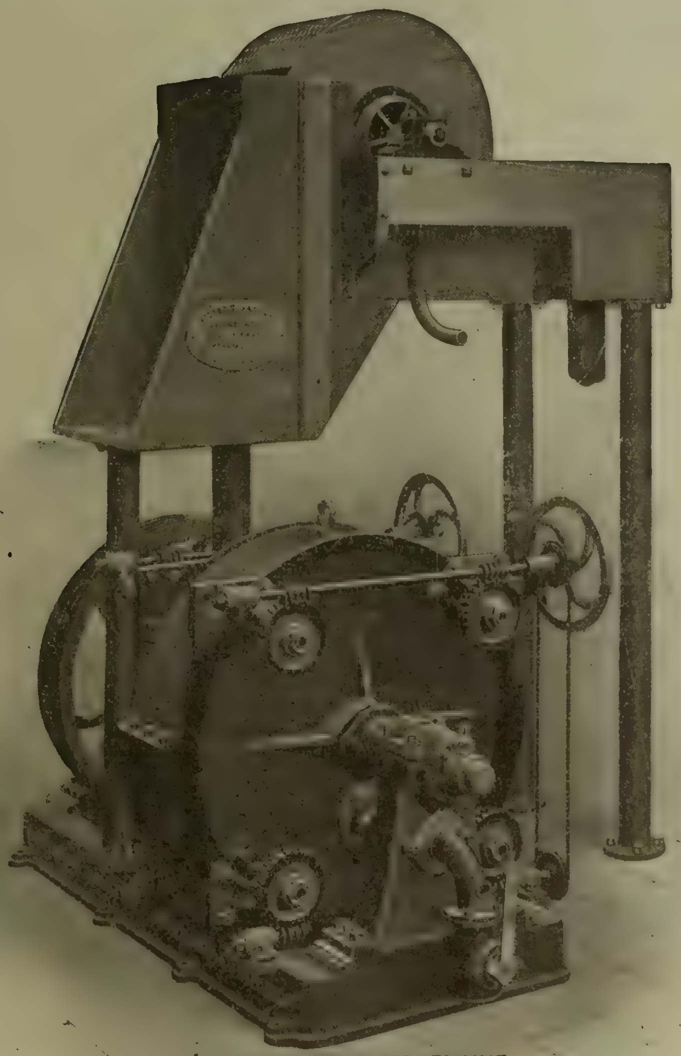

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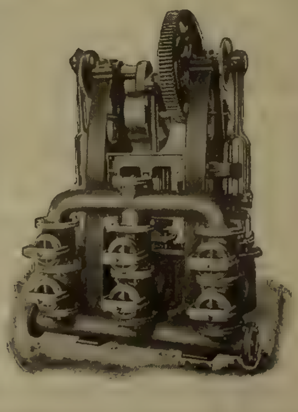

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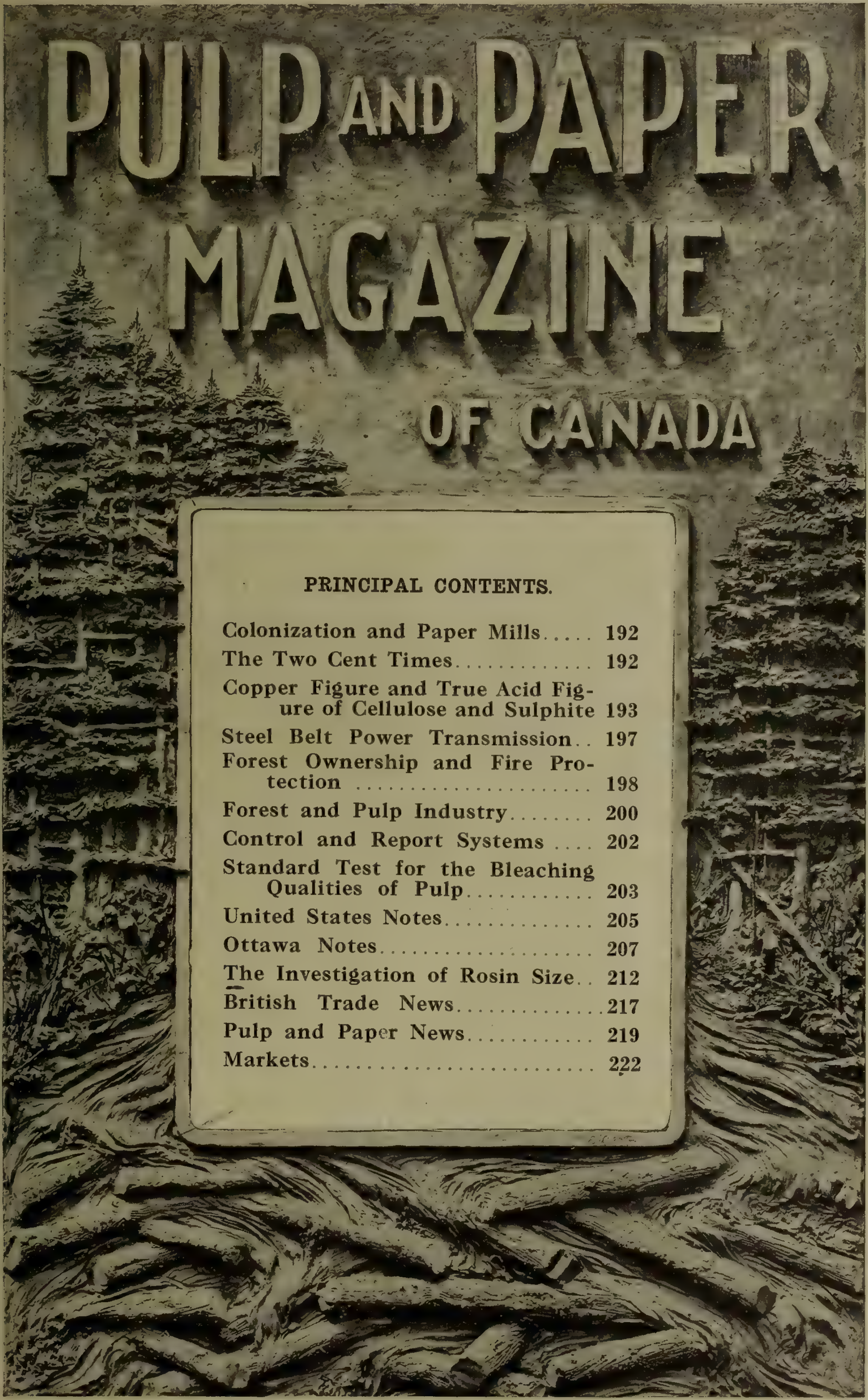

PULP AND PAPER MAGAZINE OF CANADA

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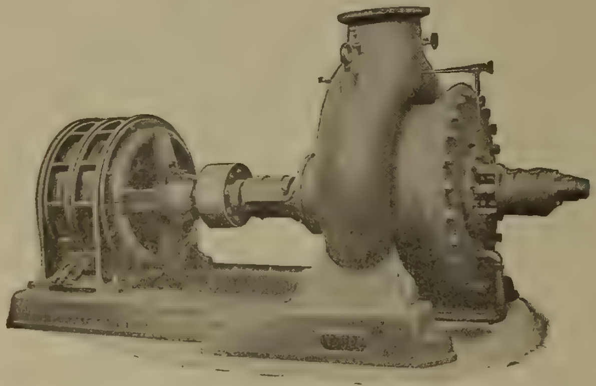

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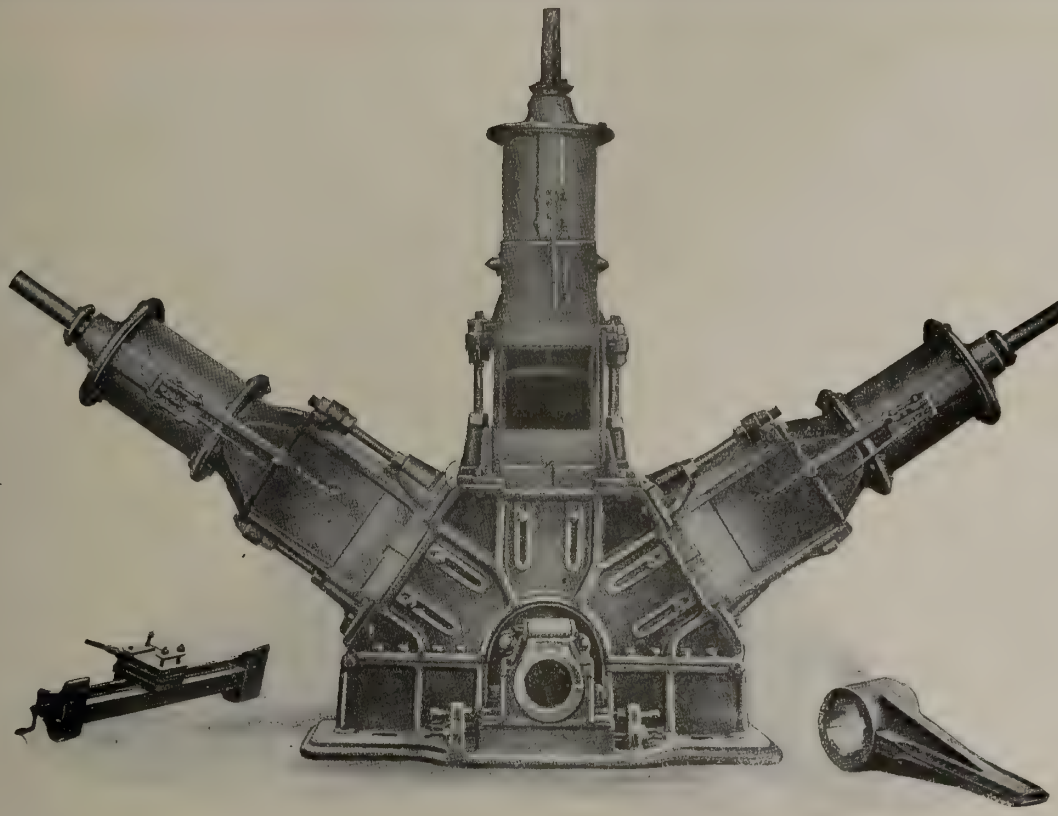

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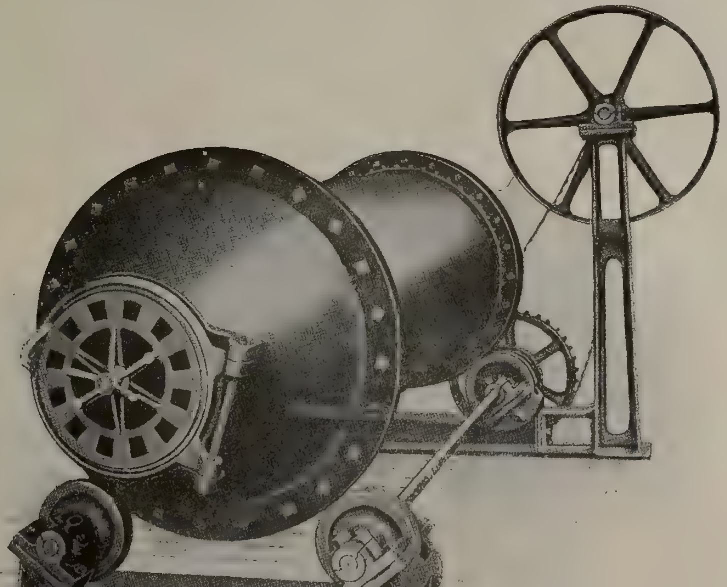

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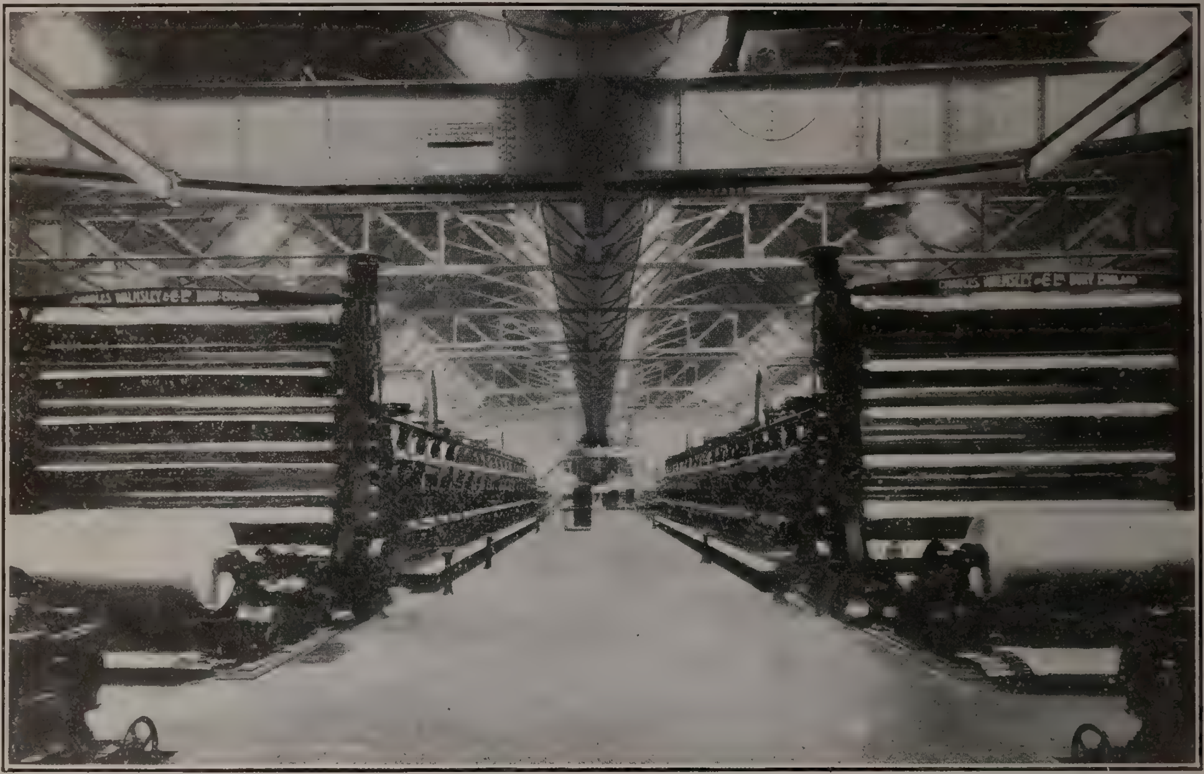

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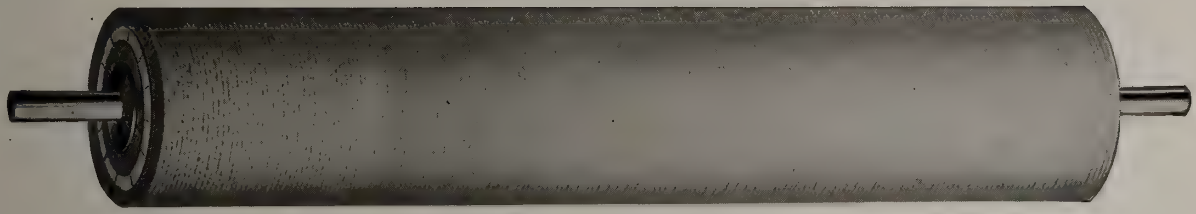

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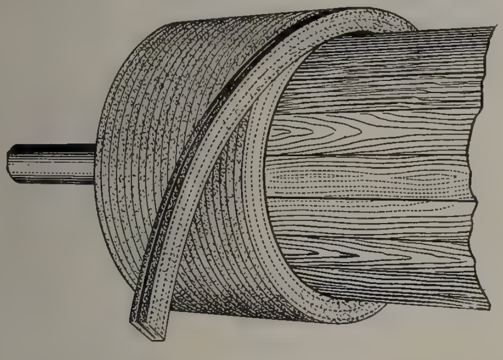

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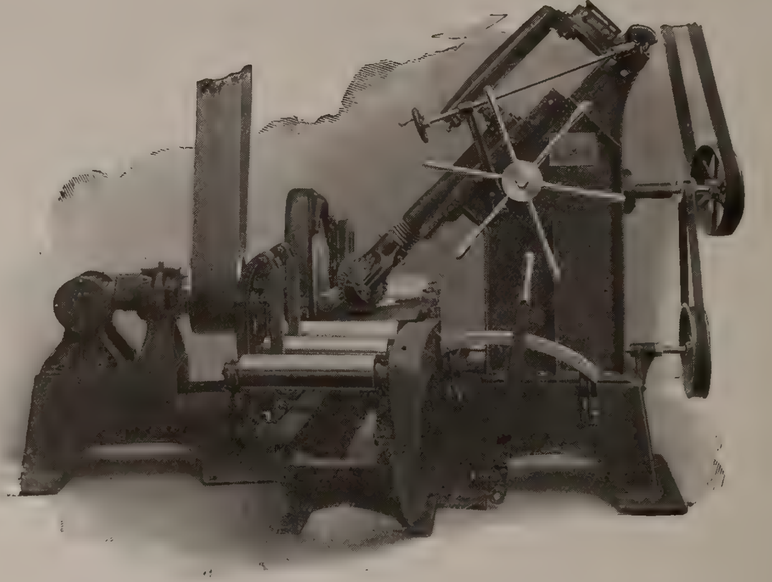

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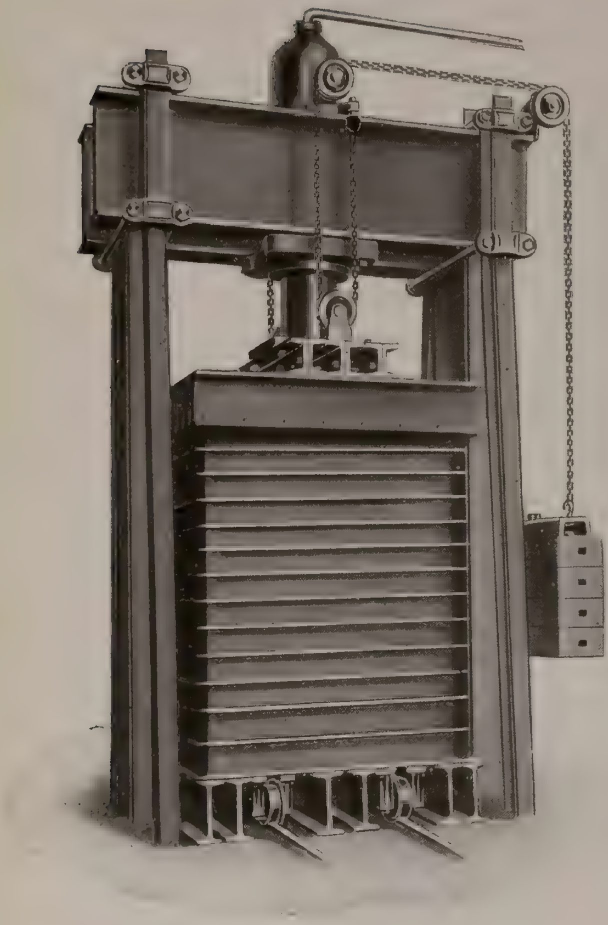

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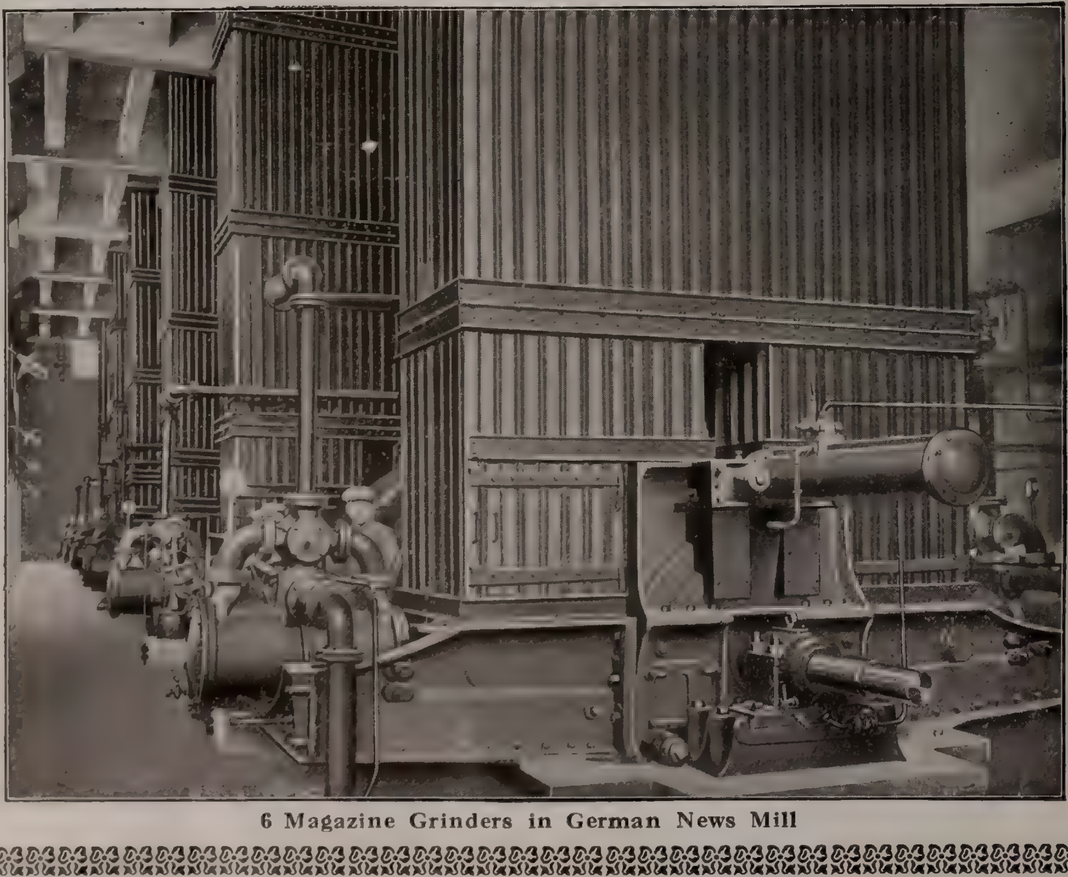

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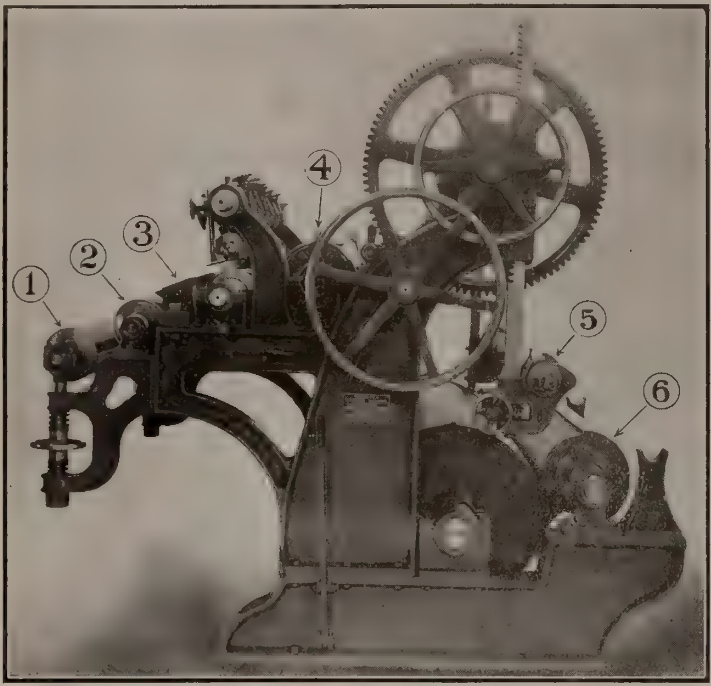

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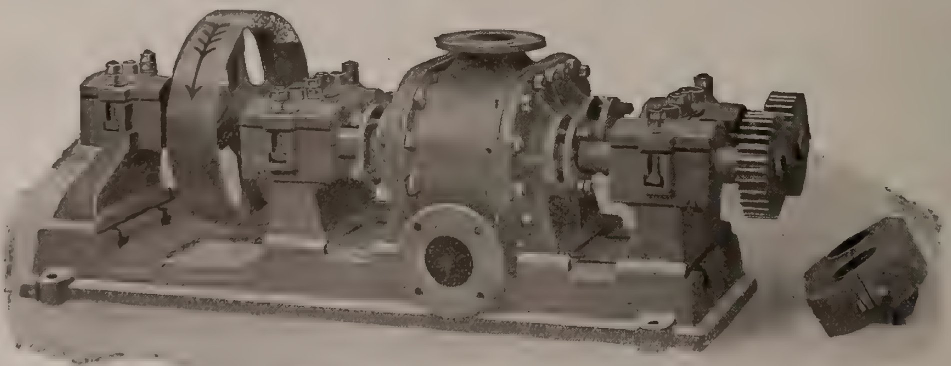

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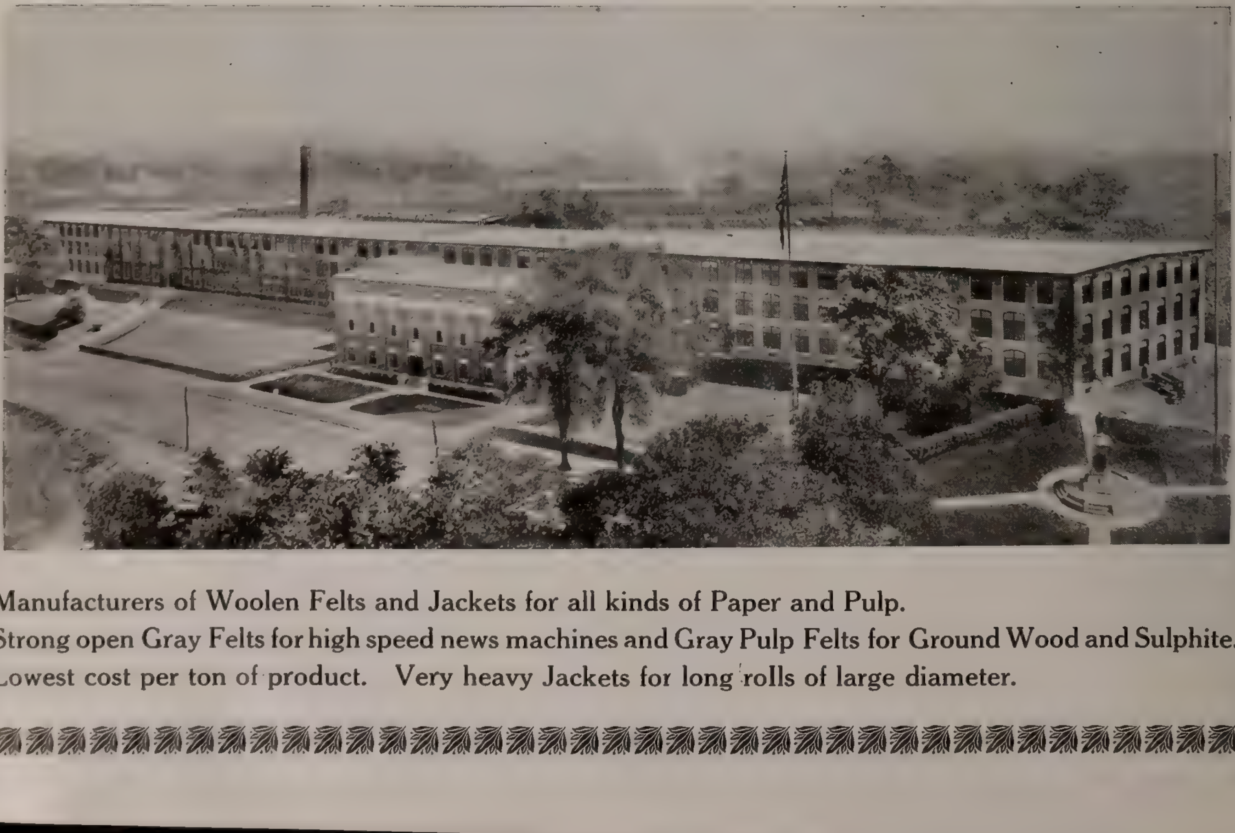

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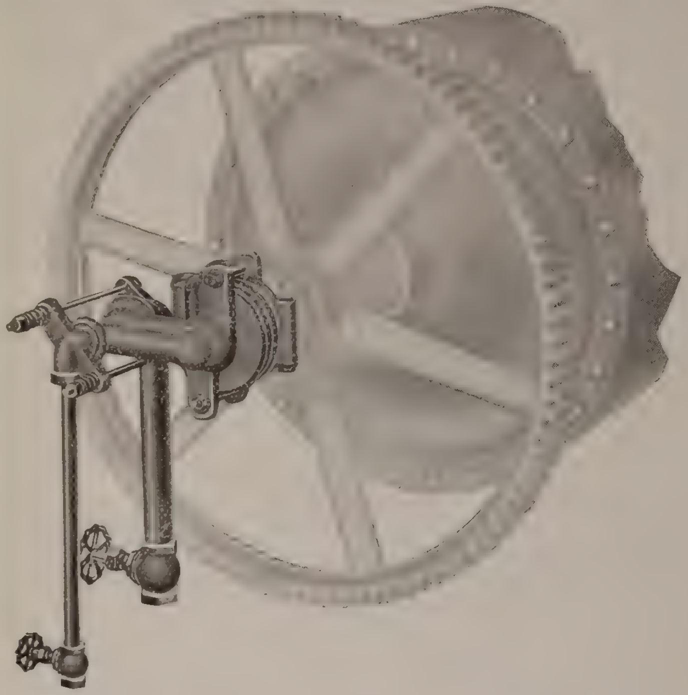

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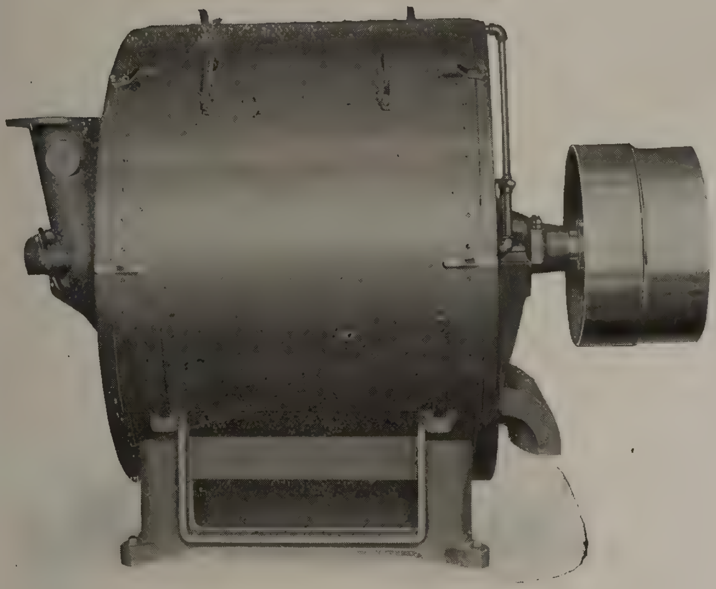

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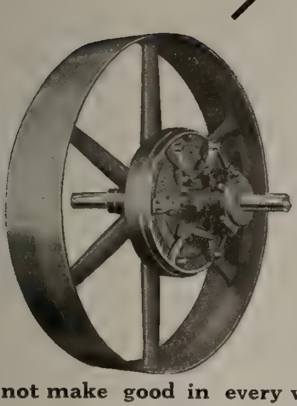

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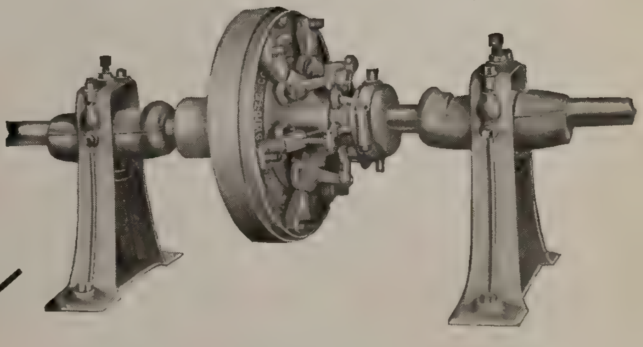

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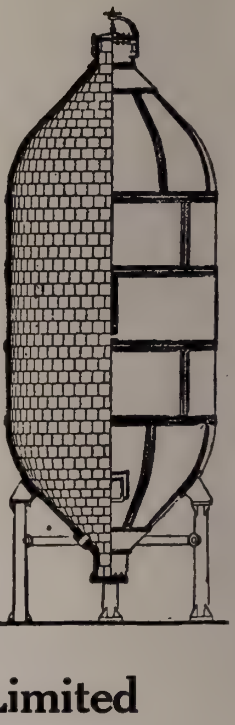

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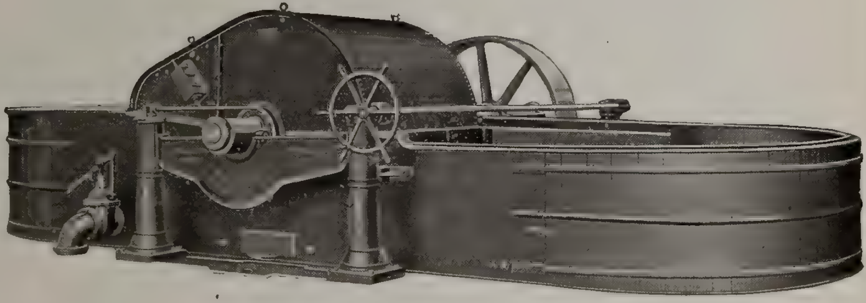

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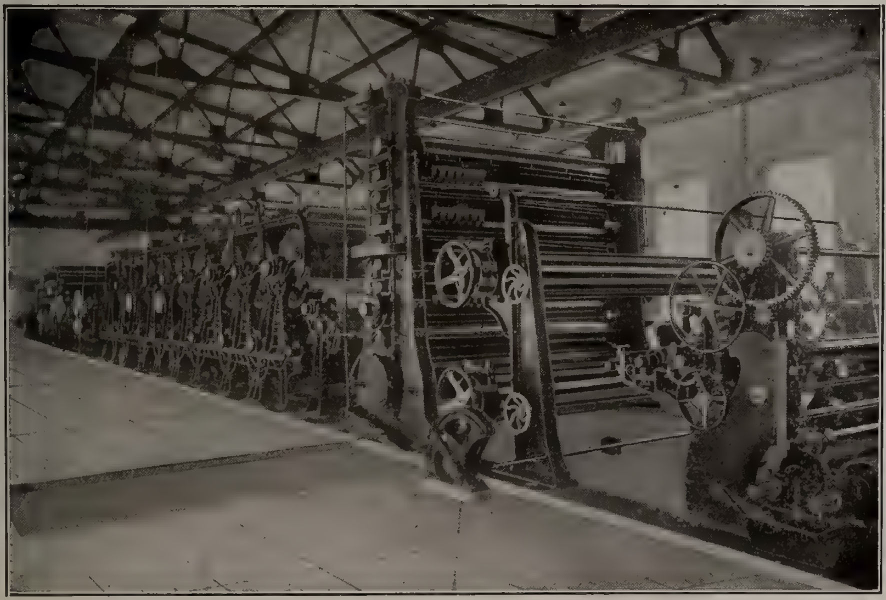

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VOL. XII. **MONTREAL, APRIL 1, 1914** **No. 7**

Colonization and Paper Mills

A bill has been introduced into the New Brunswick Legislature by the Premier providing for a large colonization scheme in Sunbury and Queen's counties of that Province. An English syndicate will be granted 20,000 acres of Crown Land, which may be increased to 50,000 if desirable, to be split up into hundred acre lots with 200 families to be settled within fifteen years. The dea, of course, to populate our country by desirable immigrants and other parts of the British Empire, is an admirable one, but it is a serious question whether the many schemes which have been proposed from time to ime throughout Canada to settle people on lands which re better adapted to forest growth is advisable. The people from the other side coming out here under such provisions are planted without adequate assistance on these lands which they must clear and bring under cul- ivation. Past experience has shown that such colon- zation has always met with only partial success or bsolute failure. About ninety per cent of those immigrants are always disappointed, having been led to elieve rosy tales of a free country, which are usually true, but which they do not see through the perplexity f the initial struggle. Lands throughout the west are, of course, free from this object, but many govern- ents and individuals have made the blunder of try- g to settle forest lands with these people, who are nfamiliar with the ways of this new country. The sult is invariably that these settlers for two or three ears burn up the country, clear their little patch of nd and destroy a great deal of the surrounding for- t, only to leave disappointed after a few years to join e mob of industrial workers in the large cities. The lp and paper men are directly affected by these proposals, for it is quite probable that history will repeat itself in these new schemes which are promoted, such as the one before the New Brunswick Government. There are 8,000,000 square miles of land in Canada, which is not adapted for anything else but growing timber. The forest reserves of our country are the largest individual raw material we have. Instead of depleting our forests to no end, it would be far better in most of these instances to encourage tree planting and scientific forestry and allow the land to produce its natural revenue of raw material at the large profits which are shown in France and Germany and not have semi-agricultural lands covered with discontented settlers and blighted hopes. This aspect of such schemes is usually lost sight of, but is very important, and should be well considered by lumber people and everyone interested in the welfare of the country.

The Two Cent Times

"The London Times," controlled largely by Lord Northcliffe, has reduced its price from 2d to 1d. This is a very significant fact to the newspaper trade, and as such has been commented upon throughout the world. "The London Times" is without doubt the leading newspaper of the world from all points of view and this giving way to a democratic spirit by reducing its price to the same level as other popular-priced papers, is another indication of the breaking down of aristocracy before the advances of democracy. It is stated that there never was such a demand for a newspaper as over this first 2c "Times," that the offices were beseiged by newspaper agents who cannot be given more than one copy in ten of those ordered. This paper controlled by the owner of the News mill in Newfoundland, is printed on Newfoundland paper, and there is no doubt that this reduction in price will mean a very large increase in circulation. This is another result of the benefits of the paper industry to civilization. The manufacture of paper is the only industry which in the face of higher cost of labor and raw materials is putting out cheaper product. This cheapening of paper has been the greatest boon to civilization, of any non-Christian influence. Of course, it is agreed that the price of news print is now the lowest it will ever be, but the difference in cost of white paper to the publishers at the present time, from what it was when the "London Times" used to sell for 12c, has made the wonderful development of Twentieth Century Newspapers possible.

A Short Talk to the Employee for the Employer.

An employee who allows himself to be overworked, lessens his value to the man who buys his services.

But there are at least two kinds of "overworked" people; to which kind do you belong? Think this over carefully, for your decision, and the action, based on your decision are **vital** factors in your success or failure.

The first kind of "overworked" employee is altogether too common, every employer of experience knows him, and is on guard against the fellow. He is the one who never reaches his work a minute ahead of time, and who watches the clock all day long for the sole purpose of informing himself as to how many hours and minutes more it will be, before the day's toil is done.

This rather worthless fellow is almost invariably a grumbler and is never satisfied. He shirks as much work as possible and, he is always beginning a new task in a heartless manner, as though it was a terrible penalty, the worst of these fellows being that their "shirk and discontent" is a disease, which is infectious. Gradually he produces in others the same symptoms as he himself has. The worklessness that he displays is soon evident in his companions. This fellow is the kind who is sure he is overworked, and that he is worth more to his employer than he is getting. He ought to be; otherwise where would the employer's profit come in? You who hire your services to others must always bear this in mind: Your employer must make some profit in his business; if he does not do this he cannot afford to remain in business.

If he pays you all the profit you earn, then he does not make a cent out of your services.

If an employer understands what he is about he determines to make a certain profit out of employing you.

With that idea of profit fixed in his head, he wonders if it is possible to grant you your request for an increase in your wages.

In all justice to both parties, he should decide what you are worth to him per week, and deduct from that a reasonable amount of profit that he wants for employing you.

The difference is exactly what your weekly salary should be.

The cry, "He's got a pull," etc., all leading to the cry of favoritism, is heard everywhere. As a rule there is very little cause for the charge. Of course, there are some employers who are guilty of showing undue favoritism, but those who do are soon failures, or the man higher up inquires into a few things, then a capable man is put in the favorites place.

It is often heard corporations have no souls. Why should they have? It is not their line. They are engaged in buying materials and services on which to make a profit, And they want just the kind of services that bring them in a sure and large profit.

The man who has such services to sell is always in demand, and at higher prices than are paid to the shirker. In this country there are hundreds of men working for these corporations, who receive higher salaries than the president of the United States. Why? Because they are men who produce results and are in themselves successes, and help to bring the companies for which they work on a higher plane of success.

It is the grumbler, the clock-watcher, who wants all he is worth without allowing his employer any profit who is slated to go, when any discharges are to be made. Don't go on looking for something in return for nothing, and don't expect all you are worth; allow the other fellow a share of your value in return for putting up the capital that makes it possible for you to be employed. Cultivate a sensible view of the question, live up to that view, and you won't be long in discovering that there is a larger balance between your value and the employer's profit. Do everything you do with a vim; do it honestly, as well as industriously. Don't be afraid of overworking, wherever you work; whatever the number of hours, work for all there is in it. Then you will find that your employer will give you all he can afford to do. And the man who is known to work without a watcher, finds the securing of employment one of the easiest things in the world. Look for promotion systematically, and, quietly let your employer know from time to time that you are doing this. Don't take up too much of his time, discussing this subject with him, but continue to keep it in his mind that you are prepared with all your energies to demonstrate that you will be worth more money in a more responsible position.

GEO. MacLEAN,
Buckingham, Que.

A DURABLE PAPER FOR NEWSPAPERS UNAPPRECIATED.

As a result of a movement started by librarians in the United States to secure copies of daily newspapers printed on a quality of paper that would withstand the ravages of time, the Brooklyn Eagle printed an edition on paper containing 75 per cent. of rags for binding purposes. This has now been dropped. It appears there were only 14 subscribers, at an annual rate of $15, a total of $210. The paper cost $2,367, the resulting loss being $2,157. The librarians in the United States who deplore the deterioration of newspaper, and the future loss of all records, were found wanting when it came to paying an annual subscription of $25 a year. It is not a question of not being able to secure a durable paper but the indisposition of users to pay an equivalent price

COPPER-FIGURE AND TRUE-ACID-FIGURE OF CELLULOSE AND SULPHITE.

ERICH RICHTER, D.Sc., D.E.

Among the reactions on cellulose or its substitution and decomposition products, for many reasons the reducing effect of them upon alkaline copper solution takes an important place. The reaction was first used by Vignon and later introduced as a quantitative test on cellulose of different kind and origin by Schwalbe. The latter has published many details and experiments about it, it appears to the writer, however, that the application of this method for investigation of chemical pulp, has hitherto not been well defined to its proper place and that, not denying its usefulness for many important technical questions, its value has been sometimes overrated. Having used the copper-figure method and its variations to some extent himself, the writer thinks it not out of place, to give his experience in this respect. Before entering into a detailed discussion, it will be of advantage however, to give first the method of determining the copper-figure as described by Schwalbe in Zeitschr. fur angew. Chemie 1910 p. 925.

The degree of bleaching, expressed by the copper-figure, is determined in the following way—

2-3 grs. of substance, which is cellulose of any kind, is put in a hard glass flask of 1,000 cc. capacity, together with 200-300cc. boiling water and 100cc. Fshlings solution. Into the neck of the flask, which should be long enough, a cooler is inserted, fastened by a clamp. Any rubber or cork connection has to be avoided, because it has been found, that the condensing water will dissolve reducing substances from it, thus increasing the copper-figure considerable. The cooler is provided with a glass-tube in the middle, which goes all the way through, keeping a stirrer in its place. The apparatus being complete, substance and liquid are heated to boiling and kept at this temperature for exactly 15 min.

The cellulose material for this test should be weighed air dry, and the moisture tested in another sample, because if the substance used for the copper-figure is dried first the result obtained may differ from others, as cellulose products are liable to change their chemical nature upon heating. The stirrer should turn slowly, because if it runs fast, a funnel is formed in the liquid which draws air in. Air coming in contact with cellulose in hot alkaline solution oxydyses more or less of the fibrous material, thus more copper would be reduced. Having boiled the substance for 15 mins. residue and liquid are filtered through a Buchner funnel with filter paper and thoroughly washed with hot water. Care should be taken, that during filtering, cellulose and precipitate are always covered with alkali solution. The residue is then brought into a dish, covered with weak nitric acid (about 7 per cent) and heated slowly. The precipitated copper-suboxyd generally dissolves fast. However, it happens occasionally, that some copper solution still remains with the fibrous residue. In that case, some strong ammonia is added first, acidifying again afterwards. The copper being in nitric acid solution, the metal is deposited from it, best by means of electrolysis. For exact experiments with this method, the reducing effect of the filter-paper on alkaline copper solution has to be considered. The author is of the opinion, however, that generally it can be neglected. The more so, if not a large funnel is used for filtering, but a good-sized Gooch crucible. The filter is then so small in size and weight, that its contents of reducing substances need not be considered.

Among the many kinds of cellulose there are some, which absorb and reduce the copper solution at ordinary temperature. In fact, probably all technical celluloses do it to some extent. As there has not been found any regularity in regard to the absorption figures, in scientific investigations, these so-called Hydrat-copper figures have to be known. They are tested by inserting a separate sample of cellulose in cold Fehlings solution for about 45 minutes. The substance is then filtered off and washed as described above, but this time with cold water, until all excess of copper solution is removed. The residue is treated with nitric-acid again and the copper determined. To get the true copper figure, the Hydrat copper is substracted from the one received when the material had been boiled.

Below an example, how to figure the copper test—

$$\text{Copper-figure} = 100 \times \frac{\text{Copper}}{\text{Cellulose used}} \times \frac{\text{Air dry cellul.}}{\text{Dryed Cellulose}}$$

Considering that it meant saving of much time and work, if only one kind of test had to be made on each sample, the author has endeavored to find out how much Hydrat copper was generally precipitated on Sulphite pulp. Six samples thus tested gave the following amount of copper per 1 gr. dry substance—

No.	Copper gr.	Hydrat-Copper Figure.
1	0.0020	0.20
2	0,0018	0.18
3	0.0012	0.12
4	0.0024	0.24
5	0.0030	0.30
6	0.0016	0.16

It will be seen that the Hydrat copper does not vary very much, and that for practical purposes the testing of it can be omitted, the ordinary copper figure alone giving a comparatively reliable picture of the quality of a sulphite pulp. Schwalbe found in 10 samples chemical pulp Hydrat copper figures from 0.22—1.15.

Some copper-figures as given from the same author are the following—

	Copper figure.	Copper figure.
Absorbent cotton	1.6	1.2
Absorbent cotton, mercerised	1.1	1.1
Mitscherlich Cellulose, unbleached	2.4	—
Ritter Kellner Cellulose, unbleached	2.8	—

I found on different samples of Sulphite pulp—

Sample No.	Copper-figure.
1	2.5
2	3.8
3	2.9
4	5.1
5	4.9
6	3.6
7	4.8
8	5.6

It now remains to explain, what the results mean under different conditions and with different materials. Schwalbe says, p. 625 in his book on cellulose, that the copper-figure is a direct expression of the degree of bleaching of pulp or celulose, and p. 631, this is explained to be the degree, down to which the material has been freed from Ligninmatters or impurities. This is, however, a mistake. The copper-figure never runs proportionally to the percentage of Lignin contained in the fibre material, at least not in chemical pulps. It may be, that with almost pure cotton, the copper-figure is in relation to the amount of impurities present, but as a rule, it cannot be used to test the degree of bleaching. In the following table, some of the copper-figures found with Sulphite pulps are given, together with the percentages on Pitch, Cellulose and Lignin.

Pulp No.	% Ether pitch.	% Alco. pitch.	% Water ext'ct.	% Ash.	% Lignin.	% Cellulose.	Copper-figure.
1.	0.88	0.23	0.11	0.20	3.2	95.38	4.85
2.	0.65	0.21	0.71	2.07	4.9	91.46	4.0
3.	0.95	0.21	0.10	0.26	3.0	95.48	3.8
4.	1.12	0.13	0.12	0.32	3.1	95.21	4.86
5.	1.16	0.16	1.30	1.24	2.6	93.54	3.63
6.	1.14	0.16	0.26	0.35	2.2	95.89	3.82
7.	0.84	0.23	0.11	0.24	1.8	96.72	5.5
8.	1.01	0.17	....	0.20	2.0	96.58	5.7

It can be seen, that the copper-figure varies irregularly, certainly independent of the amount of Lignin present. The two samples with the least Lignin, No. 7 and 8 have the highest copper-figpre. It can also be seen, that the last-named test is not in ratio with any other standard determination given in the table above. Having proved in work previous to this, that the percentage of Lignin actually gives the exact amount of impurities in extracted cellulose (1), the difference being pure cellulose, tested according to the somewhat modified method of Renker (2), it is obvious, that the copper-figure does not represent the degree of bleaching, but something different. According to Schwalbe, it also represents the amount of Hydro and Oxycellulose contained in a pulp sample. The first question would be therefore, which Copperfigure do we get with pure Hydro or Oxycellulose. The little table below will give an answer to this question:

Hydrocellulose.	Copper-figure.
1—Made from cotton satin with conc. Sulphuric acid	7.9
2—Made from cotton satin with Sulph. acid 45 deg. Be	3.9
3—Made from cotton satin with Hydrochloric acid gas	4.0
4—Made from Filterpaper	5.7
5—Made from Filterpaper	5.6
6—Made from Filterpaper	6.2
7—Made from Cotton	5.2
8—Made from Mercerized Cotton.	8.8
9—Made from Parchment paper with 3 p.c. Sulph. acid..	8.7

Vignon found, though with another method—(3)

	Copper-figure.
Hydrocellulose	9.70
Cellulose precipitated from Copper-Ammon.-Solut.	4.39
Oxycellulose	14.70
Starch..	98.6

Above figures impress on anyone, first of all, that the copperfigure of Hydrocellulose at least, is not a constant figure, varying considerably with the material, from which it was made. It also varies with the method used, to produce the pure Hydrocellulose. The copper-figures on samples 2, 3, 4, 5 and 7 are no doubt too small, if we compare them with others, found on Sulphite pulp. Of course, it is hard to decide, whether the Hydrocelluloses mentioned above, have all been of a 100 per cent type or not, and most likely, they were not. It also may be, that different raw-materials give different kinds of Hydrocelluloses. Anyway, our present lack of knowledge in this direction, leaves an uncertainty in regard to the limits of the copper-figure which in turn, allow us to use it as a comparative test only.

So much may be said about this determination with relatively pure material; but with the copper-figure of chemical pulp, other points still have to be considered. Sulphite for instance contains a certain amount of lignin, whose nature and action on copper solution has not been explored thoroughly yet. The pulp also has always a certain quantity of Pitch, which can be extracted with Ether and Alcohol. This pitch will also reduce copper in Fehling's solution to some extent.

Since it is impossible at present to determine the influence of the Lignin substances on the copper-figure, we will at least try to find out what difference it makes, whether pitch is present in pulp or not. Some results of experiments may be given—

Pulp sample No.	%Ether-pitch.	Copper-figure.
1(a)..	0.80	5.7
1(b)..	....	4.9
2(a)..	1.01	4.4
2(b)..	....	3.4
3(a)..	1.12	4.8
3(b)..	....	3.8

In this table, "a" represents the unaltered pulp, while "b" is the same sample extracted with Ether, Alcohol and Water, previous to making the determination.

It can be seen, that the respective copper-figures vary considerable. Consequently, when testing the exact amount of reducing substance in Sulphite pulp, the pitch contained therein should be removed first. For technical purposes, however, it may be sufficient to know the copper-figure and the percentage of Ether-pitch of the raw material. So far as the author's experiments cover the subject, it seems, that the copper-figure of raw-pulp is higher than that of the extracted Sulphite, by an amount about equal the percentage of Ether-pitch. It may be not always strictly correct, yet it will come very near the actual figure, and as it is frequently necessary to know the copper-figure as quickly as possible, a most simple method should be employed. In regard to Sulphite, the main thing would be now to decide, what does a high or low copper-figure mean to the paper maker and which is the maximum that can or should still be allowed. Through some study on this subject, I found a copper-figure of 4.8, as being about the limit for raw sulphite, while 3.8

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(2) Verein d. Zellst. & Papier-Chem. 1910.

(3) Vignon boiled the substance with acid, filtered off and tested the reducing effect of the solution only.

can be considered as the maximum for extracted cellulose. Any raw material giving values beyond the two named, should at least be looked over carefully, before it is used for paper.

We have seen, that the copper-figure represents the amount of reducing substances contained in a pulp or cellulose sample, more or less accurate. There is, however, another chemical or physical state of fibrous substances of this kind, which can be generally distinguished by a different action on organical dyestuffs, or a different ability to absorb them. Some experimentors have tried to classify cellulose substances accordingly, it has been shown, however, that this way is almost impassable at present, owing to the influence of the different and unknown physical nature of dyestuffs and celluloses. Schwalbe proposed to use a modification of the copper-figure for this purpose, and according to the author's opinion this probably serves the purpose best at present.

Schwalbe says, the degree of Hydration, that is the difference between Hydrolysier-figure and copper-figure is direct proportional to the ability of cellulose to absorb organical dyestuffs, or at least certain classes of coloring material. The Hydrolysier-figure is determined in the following way—(4a) 2-3 grs. of pulp are boiled for 15 minutes (4c) with 5 per cent ig. Sulphuric acid. The latter is then neutralized with caustic soda, 100 cc. Fehlings-solution are added and the reduction determined in the same way as done with the ordinary copper-figure.

Some results obtained by Schwalbe are the following:—

	Hydrolysier figure.	Copper figure.	Hydrolysier difference.
Absorbent cotton	3.3	1.1	2.2
Absorbent cotton, mercerized w. 8% caustic soda	3.2	0.9	2.3
Absorbent cotton, mercerized w. 16% caustic soda	5.0	1.3	3.7
Absorbent cotton, mercerized w. 24% caustic soda	6.1	1.2	4.9
Absorbent cotton, mercerized w. 40% caustic soda	6.6	1.2	4.9
Artificial silk	12.8	1.5	11.3
Viskose A	14.0	1.9	12.1
Viskose B	14.5	3.0	11.5
Viskose C	16.6	2.9	13.7
Chardonnet silk	17.7	4.1	13.6
Hydrocellulose acc. to Girard	6.6	5.7	0.9
Mitscherlich Sulphite, unbleached	4.4	2.4	2.0
Ritter-Kellner Sulphite, unbleached	3.5	2.8	0.7

Chr. Christiansen (5) found on soda pulp exclusively:—

Sample No. 1	7.3	1.1	6.2
Sample No. 2	8.0	0.6	7.4
Sample No. 3	10.0	0.6	9.4
Sample No. 4	11.9	0.9	11.0
Sample No. 5	7.9	0.6	7.3
Sample No. 6	13.7	1.3	12.4

While the author found on Sulphite, for instance:

	%Ether-pitch.			
Sample No. 1 A	0.8	5.0	5.7	—0.7
Sample No. 1 B	...	5.0	4.9	0.1
Sample No. 2 A	1.0	6.4	4.4	2.0
Sample No. 2 B	...	6.5	3.4	3.1
Sample No. 3 A	1.12	6.3	4.7	1.6
Sample No. 3 B	...	6.3	3.6	2.7

In the last table, A represents the raw Sulphite sample, while sample marked B had been extracted with Ether, Alcohol and Water, before determining the Hydrolysier-figure and Copper-figure. According to the theory, sample 1 should not absorb organical acid dyestuffs, first of all, because its copper-figure is very high and denotes high percentages on Oxy- and Hydrocellulose, and second, because its Hydrolysier-difference is very small.

In the case of unextracted pulp, it is even negative, which of course is really impossible. With this particular sample, it is due only to the pitch, which does not act on the copper-solution, when it is boiled with sulphuric acid first, as done in the Hydrolysierfigure test.

Now this sample No. 1, is exactly a sulphite, which could not be dyed and sized with the ordinary amount of size, while the sample No. 2 was made and used in practically the same manner and in the same paper mill, without the least trouble.

From these and other experments conducted later on, the above conclusions as to the permissible copperfigure of 4.8 for unextracted Sulphite have been drawn, and so far this limit has justified itself over and over again.

The copper-figure and its similar methods have been frequently the subject of detailed discussion and criticism. H. Jentgen, Vieweg and others tried to substitute some method for it, but as far as the author's experience goes, without much success. The copper-figure is an all around quantitative test and, carefully applied and used, will enlighten our knowledge on cotton products as well as on other celluloses, like Sulphite, Soda-pulp, artificial silk, etc. In regard to its applicability as a technical test, it has the deficiency of being rather slow. It is often highly desirable to know the sizing and coloring quality of Sulphite at once. In that case the copper-figure test would not do the work quick enough. The author tried at various times to replace this determination on Sulphite by a shorter one, but with little success, until an old standard method of the Riordon Pulp and Paper Co. was investigated thoroughly in this respect. This standard test had been introduced by the writer, some time before above determinations ever had been made, and at first it did not seem to have anything to do with the Copper-figure or its meaning. The results, however, soon proved a rather close connection, at least in regard to the final result.

To make the following description of this new method well understood, I may be allowed to give the history of this test briefly.

One day, complaints were heard about a certain kind of pulp. It was claimed the Sulphite was not well washed and contained too much free acid, thus causing trouble for the papermaker. Through the courtesy of Mr. Thorne, the writer had the opportunity of visiting the Sulphite mill as well as the paper mill, which enabled him to draw his conclusions independently and to take a fair sample of the material in question.

(4a) Schwalbe, Chemie der Cellulose, p. 171 & 635.

(4c) Later on Schwalbe advised to boil 2 hours, with acid.

(5) Chr. Christiansen, Schriften d. Verein, d. Zellstoff & Papier—Chem. 1913.

The first and most surprising thing that appeared to the writer, when trying to determine the free acid in cellulose, was the entire lack of well proved quantitative methods to test it. The second impression was, that the total amount was generally very small. After some study, the following method was found to give good results—

5 or 10 grs. of air dry Sulphite are broken up in thin pieces, put in a hard glass flask (6) or bottle with glass-stopper, together with about 100-200 cc. of hot water (60-80 deg. C.). The bottle is then shaken vigorously (taking care, that the heated air escapes the first few times the bottle is moved), the water filtered off with a hard glass funnel by means of a little plug of pure absorbent cotton. Bottle and substance are washed two or three times again with hot water.

To the entire aqueous solution a few drops of Jodine-eosine or Rosolic acid as Indicator are added, and the whole thing titrated with 1-100 normal caustic alkali, in case it reacts like an acid, or with 1-100 normal Sulphuric acid, should it be alkaline. The free acid thus found in Sulphite, for convenience was given in grs. Sulphuric acid per 1,000 grs. of pulp. Some determinations made, gave the following result:—

Sample No.	Grs. H_2SO_4 per 1,000 grs. Pulp.	% Lignin.	% Ash.
1	0.19	4.3	0.83
2	0.06	5.2	0.59
3	0.07	4.6	0.46
4	0.07	3.0	0.31
5	0.09	3.7	0.27
6	0.14	5.2	0.72
7	0.09	7.4	0.92
8	0.13	5.2	0.38
9	0.10	. . .	0.96
10	0.29	7.9	0.74
11	0.39	9.1	1.29
12	0.07	3.5	0.34
13	0.06	2.8	0.35
14	0.08	. . .	0.59
15	0.03	4.9	2.07
16	0.05	2.3	0.18

With the above samples the Lignin and Ash test were made, because it was thought, the free acid might be in ratio with either one of them. This, however, is not the case. Some of the Sulphites had been made in Europe, and some on tihs Continent. Practically no difference can be seen.

Mill tests, made continuously in a Sulphite plant, give some of the following values:—

True Acid-figure.	% Lignin.
0.08	2.9
0.12	2.8
0.09	3.6
0.11	3.8
0.02	3.0
0.06	3.2
0.10	2.9
0.09	3.0

More tests were made in other mills, but there could not be found any connection between any standard test known, and the so-called "True Acid-figure."

When looking over the results given above, one will discover that the free acid varied between rather wide limits and that it came sometimes very near the neutral point. It was, therefore, a subject of much interest and consequently research, to see whether any Sulphite could be found, that was absolutely neutral or even basic character, or not. When that sample turned up, which could not be dyed and sized, the author tried the true acid-figure with it, and was much surprised to find it decidedly and rather strongly alkaline. On an average, 5 grs. of pulp used 1.0 cc. of 1-100 normal Sulphuric acid, which amounts to —0.098 grs. Sulphuric acid per 1,000 grs. pulp. Considering that the Sulphite pulp is manufactured with an acid, and that on the other hand, as is well known, any cellulose will absorb and strongly retain mineral acid, more especially volatile kinds like Sulphurous acid gas, it forces one to think, some peculiar reaction must have taken place with that pulp. Obviously this must have been during the cooking. Some practical experiments along this line with a little experimental digester proved it as the right theory. Any pulp kept boiling for too long a time, with even very weak acid, gave a high copper-figure and reacted either neutral or alkaline, if tested for the true acid figure.

Having found a connection between the cooking process, the copper-figure, true acid-figure and the dying and sizing qualities of Sulphite, it was comparatively easy to find some more samples, from different mills, which would allow to widen the experience, by showing a deficiency, either when dyed or sized. Some of the results may be given:—

No.	True acid figure.	Copper-figure.	% Lignin.	% Ash.	Remark.
1	—0.06	4.96	2.9	0.78	Hard to size.
2	—0.08	4.88	3.1	0.20	Hard to size.
3	0.00	4.85	2.6	0.27	All right.
4	0.00	5.00	2.2	0.90	All right.
5	—0.12	5.00	4.6	0.80	Hard to size.
6	+0.10	3.60	2.6	0.68	All right.

From the above it can be seen, that it is necessary for good Sulphite to react like a weak acid under the circumstances, under which the true acid-figure test is made. Of course, this does not explain the why and wherefore of it. Whether the impurities or the cellulose itself are the causes for this acid reaction or not, we can not decide definitely. The occasional detection of alkaline Sulphite seems to suggest, that at least the latter reaction is brought about by the cellulose substance itself. Which ever way it may be, the experiments prove, that the free acid is in close relation to important papermaking qualities. As an advantage of the method, it is to be claimed, that a determination can be made in a few minutes, and that a neutral pulp gives a natural limit. Anything below the zero point can be considered as troublesome for the papermaker, if he uses the Sulphite unaltered.

In case the pulp is bleached first, the hard sizing and coloring disappears, of course, but the natural consequences are, that some more bleach liquor is used, and that more fibre material than usual is lost in the operation, owing to the oxydising qualities of chlorine, acting upon the alkaline Sulphite much stronger than on any other. Another thing, which is of advantage with the true acid-figure, and which is frequently overlooked with other tests and methods, is the rather large sample that can be used conveniently. With the copper-figure, 2-3 grs. only are available for this purpose, while here it makes no difference, whether 5, 10 or 15 grs. are used. Even with as much as 10 grs., the sample of a whole digester has to be taken carefully, in order to reach the average; but with 2-3 grs. it is infinitely much harder to get the same result. At least two copper-figure tests have to be made in most cases, and from experience, the writer can tell, that with Sulphite, often as many as three did not seem to suffice. The advantage of the copper-figure lies principally in the fact, that it is an all around method, for any kind of cellulose, which, of course, cannot be said from the true acid-figure at present. Yet it may be, that some experiments with a number of soda, sulphate and other pulps, may prove its adaptability to different conditions. At the same time the true or free acid-figure will give results, of course, which refer to certain qualities only, while the copper-figure in connection with its variations, allows a number of other conclusions, although even so, we are still often at large, as to the exact meaning of it.

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(6) The best thing to have in this case, is a flask of molten Silica.

Some other copper-figure tests made on Sulphite some time later, may be interesting in connection with this chapter, although there is no direct relation with the experiments described above.

Schwalbe, in his book on cellulose makes the remark, that the Hydrolysier-figure and copper-figure may change in pulp run over a drying machine. The respective determinations were made by the writer with the following results:—

Sulphate from—	Hydrolysier-figure.	Copper-figure.
Vat	4.6	4.7
10th Dryer	5.05	4.63
Last Dryer	5.43	4.37

All tests were made double and the samples taken as the pulp ran over the machine, so that they were always cut from about the same place of the sheet. We can see, indeed, a continuously increasing Hydrolysier-difference, and a decreasing copper-figure, owing to the influence of the temperature.

Another chapter of cellulose and papermaking practice that would be interesting to investigate and whose results should be beneficial to the industry if the research is done thoroughly, is the application of the methods described above on the bleaching processes of technical celluloses. As far as the writer knows, not much, and partly no work at all has been done in this line yet.

EAST CANADA PULP CO.

Messrs. J. T. & C. Donohue have purchased all the stock of pulpwood formerly belonging to the East Canada Pulp Company, Limited, at Murray Bay, now in liquidation. The wood is in the yard booms and also uncut on the company's limits, on the Murray River and its tributaries.

The purchasers have also acquired the new pulp mill. It is estimated that some three hundred hands will be employed. Montreal Trust Company, who are liquidators, report that they are encountering many difficulties in winding up this estate owing to the numerous liens which are claimed on the pulpwood, also on account of the fact that having been cut on Crown land it is impossible to ship same before being manufactured into the United States. Recently, however, they secured the consent of the various lien holders to a sale of the wood by tender.

Steel Belt Power Transmission

(From Our London Representative.)

In England there is a very interesting investigation being carried out into the use of steel belts for power transmission in paper and textile mills. I find that these belts have to a great extent replaced cotton rope drives in a number of important applications, and also leather, and an inexpensive method of conversion has been devised whereby the conversion of a complete rope race can be undertaken on a Saturday midday and be completed with the steel belts ready for running for the following Monday morning.

According to one well-known authority on the subject, Mr. Bernard Kruger, of Manchester, the conversion usually increases the horse-power available at the driven shaft by 7 to 25 per cent and he says that assuming that the necessary conditions could be fulfilled, steel belting transmission is guaranteed to give the following advantages:— (1) An efficiency in power delivery of 99 to 99½ per cent, as against a loss of from 4 per cent to 15 per cent in straps and 6 per cent to 25 per cent in ropes. (2) Great Steadiness—a necessity for paper mills. (3) Favorable use of space. The distances of pulleys are optional to a great extent, depending on the speed; a perpendicular drive is no disadvantage for steel belt driving. (4) Absence of stretching. A steel belt does not stretch by use, as has been shown by five years' experience. (5) Even running and freedom from slip. Transmission by steel belt is uniform and invariable. (6) Narrower width. A steel belt is only about one-third as broad as a corresponding leather belt, consequently the pulleys would not cost so much. (7) Greater power under present conditions. In cases where the pulleys are limited in size it is often possible to get an increased power transmitted by the use of steel belting without any re-arrangement. (8) Cool bearings; (9) Cleanliness; (10) "Unwearability." Steel driving belts have now been in operation for six years, and tests made of the belts used at the first showed no signs of deterioration. It seems evident that the life of a steel belt is unlimited.

Dealing with the cost, Mr. Kruger says that owing to each steel belt-drive being priced on its own individual merits and conditions, it is not possible to give a statement of prices in the same manner as would be applicable to belting or ropes. "I give," he said, "particulars of a drive in which the costing has been calculated as against an equivalent drive by ropes and leather. The comparative initial cost, if new installation, is:—Ropes $1,152, leather belt $1,176, and steel belt $864.80. The minimum loss of power given with ropes and leather belting as against a maximum loss given by the steel belt and worked out on a financial basis showed the loss to be:—Rope $324 per year, leather belt $216 and steel belt $27." Mr. Kruger added that there is no question as to the practical success of the Eloesser system and it could no longer be considered to be in the experimental stage.

Recently a great deal of interest in paper and industrial circles has been manifested in this steel belting, and from what I can see and hear, I believe we are on the road to success now in adopting a system of steel belting for power transmission. Manchester and Lancashire men are elated over it.

FOREST OWNERSHIP AND FIRE PROTECTION

Are Timberland Holders Doing their Share?

By G. E. BOTHWELL.

The annual value of Canada's forest products has been estimated by Mr. Campbell, the Dominion Director of Forestry, to considerably exceed $170,000,000. Although the larger portion of this revenue is derived from Crown timber lands in Canada, only a very small percentage ever finds its way into the public treasury. Yet in the maintenance of the wood-capital on the immense areas of otherwise unproductive land in Canada by protecting present and potential forests from fire, it is the Government which bears the greater part of the cost, and also of the censure. Although the most valuable timber areas in Canada are now under license, it has been necessary in almost all cases to employ legislative stimulus in order to induce timberland owners and licencees to share the responsibility for forest fire protection. Whether even yet they are doing their share may best be judged by ascertaining just what they actually do in the matter of forest fire protection in comparison with the extent of their holdings in the various provinces.

In Prince Edward Island the wooded area does not exceed 5,000 acres—less than one per cent — and is mostly in the form of farmers' woodlots, the value of which, in a province so largely agricultural, ensures their adequate protection when supplemented by a law penalizing carelessness with fire.

In Nova Scotia however, conditions are reversed for the farm area is less than twenty per cent. A similar percentage is barren, due to repeated forest fires, and of the approximately five million acres of green woodlands, less than one hundred thousand acres is virgin timber. Practically all the valuable timberlands are in private hands, it being estimated by Mr. Whitman, a prominent Nova Scotian lumberman, that 2,500,000 acres belong to private owners, 1,864,000 acres are held in "fee simple" by lumbermen, while 1,500,000 acres remain to the Crown. Of the Crown lands only 5,297 acres are at present under licence, the remaining acreage being largely burnt over or barren.

Probably nowhere else in Canada has greater damage been done by forest fires and under existing conditions of ownership it became necessary to secure recognition of the principle that a tax for fire protection should be borne by those whose property is protected, in direct proportion to its area or value. Consequently, a tax of a quarter-cent per acre was imposed by the Government on all holdings exceeding 500 acres, and with the sum thus contributed by the lumbermen and timberland owners, the Government maintains a protective patrol which has materially reduced the fire danger in the province.

In New Brunswick there are approximately 7,750,000 acres of Crown Land, 5,000,000 acres of settlement land and 4,643,000 acres of private timber land. Of the Crown timber lands 6,485,760 acres are now under license, and all but approximately 500,000 acres will be taken up immediately, under the new timberlands act, the unalienated area being either badly burnt or barren. But, although practically all valuable timber is privately owned, the fire protective system, such as it is, may be said to be entirely supported by the Government for practically no protective patrol is maintained by timberland holders as it is not required by law. To overcome this inertia and prevent the recurrence of the Miramichi disaster, when 2,500,000 acres were fire-swept in Maine and New Brunswick, and 160 lives lost, the Government is considering the levying of a fire-tax based on the dollar value of private timberland holdings, a plan which has worked successfully in the State of Maine.

In Quebec there are 44,686,080 acres of timberland under licence, although this enormous area is little more than one-quarter of the total area of the Crown timber lands in this province. But very little of the unalienated timber is of any present value, due to its size and its inaccessibility. Consequently no attempt is made to protect from fire the greater part of the area remaining to the Crown. But timber licencees are legally supposed to protect the valuable stands of timber on the areas under license, by providing suitable patrol at their own expense, subject to the supervision of inspectors appointed and paid by the Government. Prior to 1913 there was much evasion of this regulation, and to prevent this a law was recently passed imposing a penalty of five dollars a square mile for non-patrolment of limits. Even then many of the limit-holders preferred to pay the fine and trust to luck in the matter of fires, rather than comply with the Government's requirements. There are, however, some conspicuous exceptions where these requirements are exceeded, the most striking being the St. Maurice Fire Protective Association, composed of a body of Quebec limit-holders who have co-operated to secure adequate fire-protection on their joint holdings of over 7¼ million acres. By taxing themselves one-quarter of a cent per acre they have perfected their patrol and have also installed telephone lines and look-out stations which, when the system is complete, will effectually eliminate any danger from forest fires in the areas so guarded There are other river-valleys in Quebec where co-operative protection is equally feasible, and it is not surprising that Mr. W. C. J. Hall, Superintendent of the Forest Protection Branch, wonders what the limit-holders are thinking about who prefer to pay a fine of $5.00 per square mile with no protection whatever, rather than co-operate to secure absolute protection from fire at a self-imposed cost of only $1.60 a square mile, as paid by the limit-holders on the St. Maurice River.

In Ontario, there are approximately 65¼ million acres of forest lands, of which 11,782,400 acres are under licence. The regulations for the protection of the timber on these areas are very similar to those of Quebec. The limit-holders being required to pay the entire cost of the patrol of their limits. In Ontario, however, no evasions are tolerated by the Government. As one man per township is usually deemed sufficient patrol, the burden is not a heavy one on the licencees for the Government supplies the supervision, the office-work and the fire-posters, etc., which are needed. Moreover once the merchantable timber on a limit has been removed, the limit holder is not usually required to continue the maintenance of this patrol, thereby leaving exposed to fire all the young growth which, although of little alue to the lumberman who is concerned only with the present crop, is of considerable great potential value to the Government which deals in futures. Last year the limit holders in Ontario paid approximately $92,000 for fire-protection, or little over half a cent per acre of licenced areas. The cost to the province of fire-ranging on adjacent areas was $233,000, yet the revenue derived by Ontario from Crown Timber lands, substantial though it may seem, is not to be compared with the profits accruing to the exploiters of the timber on these Crown lands.

The Crown Timber lands in the prairie provinces and in the Railway Belt in B.C., are all administered by the Dominion Government. The area of actual timber land is comparatively small being about 15½ million acres of which 5,360,600 acres are under license. There are, however, vast areas bearing wood suitable for pulp, estimated to total 42,000,000 acres, which, because of the high cost of bringing the product to market, are practically valueless at the present time. But these pulp-wood resources have a high potential value, and must be protected wherever the proximity of man increases the likelihood of forest fires—for the great majority of fires are due to careless ness with fire. The cost of protecting these areas is entirely borne by the Dominion Government, and even on the timber limits where a great many of the fires originate, the patrol is maintained and administered by the Dominion Forestry Branch, the limit-holders being only asked to pay one-half the cost of such patrol, the size of the contribution depending on the area of their holdings.

In British Columbia it has been estimated that there are 100,000,000 acres of woodland of which, according to a B.C. Government forester, 'upwards of 65,000,000 acres may be regarded as actually, or capable of, producing merchantable timber.'' Of this area, 1,500,000 acres are privately owned, 1,000,000 acres are under timber lease and 8,500,000 are under license. The remainder is, as yet, unalienated. To protect from fire the more endangered portions of these areas is the work of the Government, but to provide funds a contribution of one and one half cents per acre is required from the limit-holders. To the total amount thus received the Government adds an equal sum. As a large portion of the fires originate in the logging debris on cut-over lands, the B.C. Fire Law stipulates that a fire-line be cut around such dangerous areas. This regulation is seldom enforced, however, for the lumbermen realize the danger from logging-slash, and if possible, pile and burn it while conducting logging operations.

It would appear then, that in three provinces, Nova Scotia, Quebec and Ontario, the expense of the ''soi-disant'' patrol of private timber holdings is borne entirely by the licencees. But in Nova Scotia the municipalities have frequently to bear a share, in Quebec the responsibility may be evaded by payment of a fine, and in Ontario cut-over lands are usually exempted from patrol. In the four western provinces, timber limit-holders are required to pay only half the cost of protecting their timber from fire. In New Brunswick the limitholders are not taxed at all and in Prince Edward Island there is no need of taxation for fire protection. It must be remembered too, that in all cases the government supplies the office administration, the field supervision, and sometimes even the equipment of these patrols.

It has been estimated by the Hon. W. A. Charlton, himself a lumberman, that of the $1,5000,000 annually spent by Canada in forest fire protection, the lumbermen and railways together contribute only $500,000. It is but proper that the railways should share the cost at least equally with the lumbermen, for as Mr. A. L. Flewelling, President of the Western Forestry and Conservation Association, recently stated, the transcontinental railways ''actually have a greater monetary interest in the result of forest fires, than the man who really owns the trees and pays the taxes thereon.'' It is hardly proper, however, that so little of the total cost of fire protection should be borne by the railways and lumbermen for it is largely the fires escaping from railroad rights-of-way and from cut-over lands which necessitate protective patrol on the adjacent Government timber lands. They should certainly bear the entire cost of fire ranging on their respective holdings and should also be made more strictly responsible for all damage to adjacent areas through negligence in fire protection.

It is hard to understand the ridiculously sublime indifference of many lumbermen to the necessity of fire protection when forest fires destroy yearly in Canada from twenty-five to one hundred million dollars' worth of timber. A large percentage of these losses are on licensed land where the Government loses only the stumpage dues, whereas the licencee loses his entire timber capital, and often also his camps and equipment. The reality of the fire risk is best indicated by the fact that it is impossible to obtain insurance on standing timber in Canada.

Trusting to luck to escape from fire loss may have been to some extent justifiable when forest areas were only logged-over once and then abandoned, but the modern tendency is towards large holdings and continuity of logging, thus permitting the more economic handling of the logs and the building of fully-equipped modern mills where waste may be reduced to a minimum. In such cases, carelessness is criminal In Canada the large pulp and paper companies with their immense holdings and costly mills, find it absolutely necessary to protect their forest resources from fire in order to ensure a sustained annual cut of pulpwood. Several such companies on the St. Maurice River, Quebec, by a co-operative arrangement with adjacent timberland holders have formed a protective Association which, as previously pointed out, has secured immunity from fire on practically the entire river-valley. The patrol is organized, administered and paid for entirely by the Association, save that the Quebec Government contribute a sum equivalent to the fixed assessment, on such of its lands as receive the benefit of the patrol. In 1913 over 275 fires were extinguished by the Association's Rangers with practically no damage to standing timber. In the words of Mr. Ellwood Wilson, a member of the Association, ''The success of co-operative forest fire protection has been established beyond doubt.''

Although the first of its kind in Canada, there are at least thirty similar co-operative organizations in the United States with a total patrolled area of 25,000,000 acres. They did not arise through Government coercion, but rather through economic necessity for the recent abnormal rise in the price of stumpage in the United States—it has doubled in the last seven years—has made it advisable from a business standpoint to protect not only the mature timber but the young potentially valuable timber on the cut-over areas.

The same rise in stumpage value is manifest in Canada, and it is only a matter of time before the lumbermen relieve the government of the responsibility of protecting their limits from fire. The advantage accruing to co-operative fire protection are so self-evident that their mere citation will suffice. Low cost through economy of administration; elimination of governmental interference; reduction of danger through increased responsibility; ultimate elimination of danger through the perfecting of a fire-protective system; these are but a few of the most obvious advantages. Moreover, with the fire-danger reduced to a minimum it then becomes possible to secure insurance of forest property as well as loans based on standing timber values, for in those parts of the United States where the danger from forest-fires is negligible, timberland bonds have already been issued to the value of $150,000,000. Also when the safety of his timber is assured, the lumbermen can then afford the economy of practicing scientific forestry.

It is evident that at the present time the timberland owner in Canada is hardly doing his share in the matter of forest fire protection. But it is also evident that the more he shirks the responsibility the quicker he will have to assume it, for fire, probably more than any other single cause, has been responsible for the abnormal rise in stumpage values, and as these values continue to increase, the timberland holder will be forced by business necessity to protect his timber from the chief cause of its value increase. When the change takes place, as it will, within the next ten or fifteen years, the Government need then concern itself only with the protection of the timber lands it itself administers. But meanwhile, fire continues to consume Canada's millions in timber-wealth.

ASH OF SULPHITE WOOD PULP.

Writing on the ash of sulphite wood pulp, E. Richter, in a recent issue of Der Papier Fabrikant, says: The ash of sulphite cellulose rarely exceeds 1 per cent., and is more frequently about 0.5 per cent., calculated on dry substance. The proportion of silica is usually almost exactly one-third of the total ash, even with relatively large variations of the latter. The quantity of silica in the original wood is very much smaller than in the sulphite pulp, and it is probable that the silica is fixed by the fibre in the form of a calcium or magnesium silicate during the digestion process. Taking as a typical instance a Scandinavian pulp containing 0.59 p.c. of total ash and 0.18 p.c. of silica, it is calculated that in the course of 100 digestions, producing 10 tons of cellulose per charge, 1,800 kilos of silica must have been taken up by the fibre. Such a quantity could not possibly be all derived from the lining of the digester, and most probably it comes mainly from the bisulphite liquor. The quantity of iron in the ashes of sulphite pulps ranged, in the series of examples examined, from 1.4 to 9.2 milligrammes per 100 grammes of cellulose. The quantity of iron, however, shows no regular relationship either to the total ash or to any other character of the pulp. The ash constituents of the wood appear to have little or no influence on the percentage of ash in the pulp; this depends rather on the composition of the digestion liquor and the manner of digestion. For instance, two varieties of pulp made from the same wood and using the same limestone, but with liquors containing different proportions of combined sulphurous acid, showed in the one case an average of 0.27 per cent. of ash and in the other 0.65 per cent. Only in a limited degree does the percentage of ash rise and fall with the percentage of lignin remaining in the pulp. It is probable that these constituents are not directly interrelated, but that both of them depend on the methods of digestion.

Forest and Pulp Industry.

(Concluded from last issue)

Aside from the new woods that are coming into use there is still another tendency which is becoming marked in the pulp industry; namely, the use of slab wood and other mill waste. In 1907 the amount of slab wood used was only 193,000 cords; in 1909 it amounted to 250,000 cords. The report for 1908 shows that nearly all of this material was slabs from the sawmills, though small quantities of shavings entered in. Spruce and hemlock supply most of this material, while the remainder was chiefly pine. What utilization there has been is, therefore, of a class of material of which an enormous supply exists. There will be no limit to the movement on account of supply. It is far in excess of all immediate requirements. Taking into consideration only spruce, hemlock and yellow pine, the total production of which in 1907 was 18,315,000 M feet, and assuming one-fourth cord of available waste material to every thousand feet of lumber, we would have approximately 4,580,000 cords of available material. If conditions for the use of such material become favorable, it appears reasonable to believe that one-half cord of such material could be so utilized. That would give 9,160,000 cords, more than double the total pulpwood now required, and over one-half the assumed demand in 1950.

But the three woods which afford the basis for this calculation furnish less than half the total production of lumber. If the mill waste of the remainder could be used in the proportion, it would amount to more than 18,000,000 cords of available material.

While many other woods will undoubtedly eventually find a place in the making of pulp and paper, and mill waste will add considerably to the available supply of pulpwood, yet it is of vital importance for the pulp industry to have large spruce forests. Therefore, hand in hand, with the increasing use of new woods, and the greater utilization of the waste product of our sawmills, there must also go on the improvement of the present spruce-bearing area. Not merely protection from fires as a means of encouraging the young growth, not merely a closer utilization of the present timber, but an actual increase of the forest area, reforestation of the denuded and burned-over land. For the production of pulp it is advantageous to use small and comparatively young timber. Old timber is often brush, and does not yield as firm fiber as wood from younger tress. It need not, therefore, take centuries as in the case of lumber production, to grow timber for pulp. In Norway and Sweden, whose forests in many respects resemble our Maine woods, and which are now the source of the pulp supply of entire western Europe, the advance of the pulp industry marked a decided improvement in the condition of the forest. It made possible thinnings of the suppressed and poorly developed trees in young stand, thereby increasing the growth of the remaining trees; it increased the value of the smaller timber which has been found more suitable for pulp production; and it brought within possible economic realization the actual growing of timber for pulp. Since small timber is just as suitable as old timber for pulp, if not better, it can be grown on a rotation from 40 to 60 years, which brings artificial forests within the realization of large pulp companies. Our red spruce is not so fast growing as the Norway spruce in Europe, but even it, with proper handling and timely thinnings, can be made to produce a stand that would cut in 80 years about 2,000 cubic feet or about 12,000 board feet or 24 cords, a growth of about one-third cord per year, a very conservative growth compared with the timber production in European countries having a climate and soil similar to our Northeast. Even at such a rate of annual increment the 20,000,000 acres of spruce-bearing land in this country, under proper handling, could be made to yield an annual increment of about 10,000,000 cords a year. This increment could be probably still further increased if, instead of the red spruce, we would grow the white spruce, or what is generally known as the "cat" spruce, very common on old fields in Canada and in some portions throughout Maine and the Adirondacks. The growth of the white spruce compares favorably with that of Norway spruce and, being a native species of this country, is probably better adapted to the climate and soil of North America.

Norway spruce reaches a diameter of about 11 in. and a yield of 38 cords in forty years.

White spruce will reach a diameter of 11 in. and a yield of 38 cords in forty-five years.

Balsam fir will reach a diameter of 10 in. and a yield of 30 cords in sixty years.

From these figures you may see that forestry is, after all, not so much a chimerical undertaking, and that in view of the growing demand for pulp and the unquestionable use of wood for pulp, it is even a feasible undertaking for private individuals, especially if they are corporations having heavy investments and a long life.

Of course, this conversion of the present wild woods into dense young stands of white, red, or even Norway spruce, even if begun now, could not be accomplished in a few days. If begun now, however, while there is still a large supply of timber which is gradually coming into use as pulpwood to help out the dwindling supply of spruce, such as balsam fir, there would be enough timber to tide us over until the planted timber would come to maturity.

To sum up: If the adjustment of the pulp industry to the wood supply will take place along the lines I have attempted to sketch out here, there would eventually be brought about material changes in the industry.

In the first place, it will cause an expansion of the industry beyond the regions now chiefly occupied. Time was when the industry centered almost exclusively in New England and New York, then a new center appeared in Wisconsin, and more recently production has been growing rapidly on the Pacific Coast. If new woods are to be utilized, the tendency to expand must go much farther than it has. To what extent this expansion of the pulp industry toward the northern Rockies and Pacific Coast will go will depend upon the care with which the present supply of timber in the East is handled. The pulp and paper industry is closely associated with the centers of population, and its most logical and economic place is still where it is today, and it will depend on the men who own large tracts of timber whether it should remain here or gradually go West in search of new supplies.

In the second place, the adjustment will necessitate considerable change in the methods of manufacture. New woods will require modification in the present methods of cooking and grinding processes. The utilization of mill waste will require these and other changes, such as improvement in barkers. Evidences exist already of rapid change in all of these matters.

In the third place it will inevitably mean a closer coalition between the pulp and paper industry and the lumber industry. Thus far they have been quite independent, each going to the woods for its raw material, pursuing its own course of manufacture, and turning out its own product. From this time on we will undoubtedly see a uniting together of these two industries. Frequently we shall see pulp mills established in or near the lumber centers, where they may depend upon sawmill waste for a portion of their raw material. The coalition of the two industries would generally be advantageous. It would mean the lessening of the waste of valuable material and help in general to reform the old methods of the lumbermen. It would place the use of our forests upon a permanent and scientific basis, so that the growing of timber may be made a profitable business, and the production of pulp and lumber might go on permanently, probably with decreasing cost, with lighter waste, and with higher efficiency.

REMINGTON MARTIN.

(Special to Pulp & Paper Magazine.)

Watertown, N.Y., March 25, 1914.

The plans made public several weeks ago by Attorney Floyd L. Carlisle, acting, it is stated, for George C. Sherman, D. C. Middleton, G. H. P. Gould, D. M. Anderson, Robert J. Buck, Charles B. Rogers and himself, for the organization of a corporation to take over the control and management of the Remington-Martin Paper Company, the Raymondville Paper Company, the Norwood Paper Company, and the Norwood & St. Lawrence Railroad Company may not be carried out. and Arthur C. Hastings, president of the American Pulp & Paper Association and the head of the Cliff Paper Company of Niagara Falls, may not come here to take up the management of the proposed company. It is stated that a new plan for the future management of the concerns, which have since their organization by the late Charles H. Remington been known as the Remington group of newsprint mills, is being considered by the companies. It is also stated that none of the men above mentioned in connection with the proposed $2,000,000 corporation with Mr. Hastings as the head, are interested in this plan.

The Manufacturers' Paper Company of New York, which has been the selling agent for the Remington mills for some time, is the largest creditor of the Remington companies and is said to be vitally interested in this new proposition. The exact details of the new scheme will probably be made public in a short time. At present those who are in a position to know the exact status of the case are reticent.

Report has it that the Remington interests will take care of their financial matters among themselves, and that the group of bankers and other paper mill men will not take part. It is said that the plan is to raise $400,000, of which $250,000 would be used as a working capital and about $150,000 would apply on debts of the companies. Of the $40,000 planned to be raised it is claimed that $200,000 has already been raised in New York, and that with funds obtained in this city only about $70,000 is lacking. F. M. Hugo, treasurer of the Remington Companies, stated that definite news would not be given out before the last of this week on this feature of the proposition.

Control and Report Systems.

Pulp and paper mills are no exception to the world-wide industrial rule that every small detail has to be looked after carefully to obtain good results.

Too many failures in the line have proved that to drive the production to the highest possible and to save labor to its utmost limit is not enough, and of only secondary importance, though essential.

The saving of materials, i.e., the elimination of waste, makes the profit.

A mill operator has usually so many more important things to look after in the running of the mill that he personally has not the time to make regular daily investigations of all minor matters.

The geenral manager also needs to know how things are, in order to be able to judge whether all departments are going as they should.

It is, therefore, most essential to have a man, a comptroller, to make daily investigations and tests, preferrably a man with some chemical and practical training, making him fit to criticize his own work as well as to report immediately if anything is wrong.

Automatic recorders are expensive in first cost, and many of them need quite a lot of study and attention in order to get them to run properly, but they are, nevertheless, the best means of controlling:

1a. Steam pressure.
2a. Temperature of flue gases feed water and superheated steam.
3a. Percentage of CO_2 in flue gases.
4a. Pressure and temperature in digesters.
5a. Speed of paper and other machines.
6a. Percent of SO_2 lost in the acid system in sulphite mills.
7a. Percentage of SO_2 in the gases going to the acid system.
8a. Weight of products from the different mills and departments and also for many other similar purposes.

Other things will, however, take the larger part of the comptroller's time.

Material coming into the mills as well as all materials in the mills, raw or in state of manufacture, should be noted every day, also production, waste paper and similar materials.

Necessary test of chemicals ready for use in the different processes should be done, and instructions for charges given or, where the tests are entrusted to the men in charge, their tests occasionally checked and all their figuring gone over.

He should also make slides of fibres and compare those with standard slides, test paper for weight and strength, determine ash in paper and pulp, where this is necessary and make other determinations which can prove necessary.

If the testing apparatuses are fitted up properly to prevent loss of time, and necessary tables are made up for the different testings one man should be able to make all those tests and investigations, even for large mills, and still have time to make extracts from his own notes, as well as from records and department reports, and to make out necessary daily and monthly reports.

In every department, and at every machine and apparatus working independently, a daily record should be kept showing:—

1a. Details of the working of department or machine or apparatus;
2a. Shut downs, and reasons therefor;
3a. Necessary repairs and alterations which need not be done immediately.
4a. Occurrence of anything unusual and not commonly observed.

Those reports should contain everything that is of importance for judging the results, but should not contain anything which is not essential. The men responsible for making out those reports will soon find out what can be marked down without investigation and without detection, and from here the step is not large to mark down important facts without investigation, or so as to guard themselves from blame for mistakes made. This latter can easily lead to misjudgment, and to further mistakes until the real reason is found, and may also lead to considerable losses.

Where there is a suspicion of fake reports, the comptroller should, from time to time keep a close check on the figures in those reports in order to make sure that he gets correct figures on which to base his reports.

All departments reports, records and the results of the comptroller's tasks and investigations, should be handed over to the respective men in charge as soon as necessary extracts are made for the general report. This should be done in order to make it possible for the man in charge to compare different reports as soon as possible, to make investigations and to find remedies where something is not as it should be.

A daily as well as a monthly report (or a two or four-weekly report, where the employes are payed weekly) should be made out, giving all necessary details for judging whether anything is not as it should be in any department.

The report should contain maximum and minimum figures from previous reports, or standard figures, for comparison; the monthly reports also figures for the same period of the year previous.

It should here be said that the help of a trained chemist, with a wide practical experience, is most essential for bringing the standard figures to their best form from a scientific as well as a possible practical point of view, especially where the man in charge of the mill has no chemical training himself.

Those standard figures should be actual results obtained in the mills, not merely figures to be aimed at.

Above mentioned reports, daily as well as monthly, would be gone over carefully and discussed between the men responsible. Suggestions should be made for every possible lowering of costs of production and repairs, saving of materials, increasing of production, and so on, and remedies suggested and decided on.

If only this scheme were generally followed throughout the pulp and paper line and live men, who thoroughly knew their business practically as well as theoretically, were put in charge of the mills and their suggestions followed!!!

Our line should then, in general, be in a much more flourishing position to-day than it is.

We have cheap wood, cheap power and a large market, and our European competitors have to pay the double to quadruple price for their wood, have often to send their products by rail for large distances to nearest shipping harbor and have also to pay the large oversea freight.

Their lower cost in wages and supply materials is of secondary importance. It is their scientific management that makes it possible for them to take up the competition on this Continent!!

Standard Test for the Bleaching Qualities of Pulp

Sindall and Bacon.

Attention has again been directed to this important and interesting question by Messrs. Baker and Jennison of the Wall Paper Manufacturers, Greenhithe. These gentlemen are fully qualified to deal with the points which arise in connection with the bleaching of wood pulp, and the very suggestive paper read by them at the recent meeting of the Society of Chemical Industry is sure to attract notice.

The writers of the paper read at the Society's meeting gave a detailed account of the many experiments which they had carried ou. These were mainly limited to the behaviour of what is known as easy bleaching pulp, which rather ambiguous term has been devised, through trade custom chiefly, by considering that any pulp which did not bleach with 12 per cent. of powder to a satisfactory color, could not be described under such a term.

Such interesting and vital points as the influence of the soluble content of the pulp itself, that is to say, the compounds present in the pulp which could be extracted with water, and the degree of concentration of the pulp, came under review. The writers have emphasized the facts which have been brought up by previous workers in this sphere, that the total consumption of bleach is materially influenced by this and similar conditions. There is no doubt there have been some attempts from time to time in practice to wash out the soluble content of pulp by a previous extraction with water before adding the correct amount of bleach solution, but the economy of such a method is rather open to question unless it can be shown that the consumption of bleach by such aqueous extract amounts to at least 2 per cent. We are not aware that the normal pulps offered on the market would show as large a proportion as this. It would at least indicate that the pulp had not been completely washed before being made up into sheets.

The experiments of Temperley, made some years ago, indicating the folly of using back bleach residues from the potching engines for lixiviating further quantities of bleaching powder, were amply confirmed by these investigators, and the more precise details given, when published in the Journal of the Society of Chemical Industry, will afford useful information in this direction.

The interesting point of the degree of concentration of the pulp was discussed, and an account given of certain experiments in which the proportion of solution mixed with the pulp was varied, and it was shown that the thicker the consistency of the pulp mixture, the greater was the efficiency and economy obtained. This is mainly due to the fact that in using a very concentrated mass it was possible to have the bleach solution of higher density. It seems correct to assume that by having a liquor of higher specific gravity, in this way, the activity of the chlorine was increased. Or it would be more correct to say that the extra dilution of bleach liquor, which is obtained under ordinary practice, reduces the activity of the hypochlorite.

The most valuable suggestion of the authors of this paper was found, as is usual with documents of this character, towards the end of it. The experiments of Sindall with the use of the tintometer for the measurement of the degrees of whiteness of bleach pulp were referred to, and the authors appear to have devised a method by which the absolute color could be shown to perspective buyers. It was rightly argued that the measurements by the tintometer, though giving precise and absolute figure values, did not in themselves afford the buyer any idea of the whiteness of the paper, owing to his ignorance of the figure values. It was proposed to prepare a series of porcelain plates having certain definite color values corresponding to certain degrees of whiteness of the pulp. In this way it was hoped that the pulp agent would be enabled to present in tangible form to the buyer a sample of the pulp which was offered for sale, and also a porcelain plate representing the color which might be expected on treating the sample of pulp with certain definite amounts of bleach.

There can be little doubt that this would be rather convenient as the pulp agent could carry with him samples of porcelain plates corresponding to certain grades of white, and since the grades of white could be permanently recorded by and always corrected by the tintometer, there would be no difficulty in duplicating plates as required, and ascertaining their color values in terms of tintometer readings.

Among the analysts present at the meeting there was a consensus of opinion as to the value of the tintometer for measuring grades of white. One or two speakers referred to the accuracy of the readings obtained on the tintometer for the measurement of flour. Mr. Sindall mentioned that in his own experiments he had submitted to Mr. Lovibond, the inventor of the tintometer, a series of bleached pulps, the colors of which had been obtained by submitting a known sample of pulp to varying quantities of bleaching powder. In this way a complete set of samples showing the effect of 4, 8, 12, 16, 20 and 24 per cent. of bleach had been used. The samples were numbered in a promiscuous order and the readings tabulated, showing the gradual elimination of the red and yellow coloring matter, which corresponded in practically every case with the correct order of the samples as bleached.

The chief value, however, of the paper submitted was the suggestion of permanent white colors in the form of plates, and since the color of such plates could easily be checked by the tintometer, it is clear they would have a technical usefulness for the purpose already described. The comparison of the rough paper texture with the smooth surface of a porcelain plate does not offer any serious difficulty according to the experience of Messrs. Baker and Jennison.

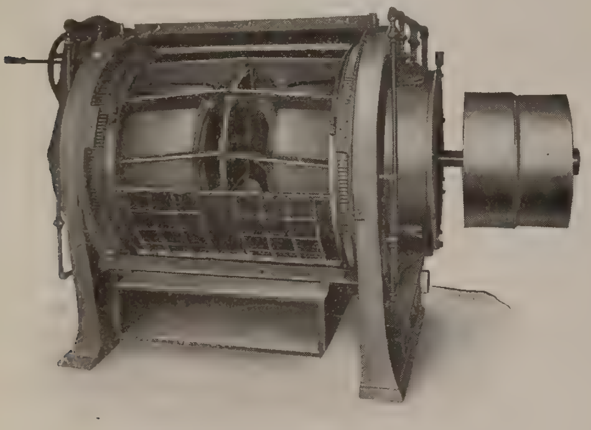
TESTING DEGREE OF BEATING PAPER PULP.

E. W. L. Stark, in a recent contribution to Der Papier Fabrikant, on the subject of an apparatus for the testing of the degree of beating of paper pulp, says a measured quantity of pulp from the beating engine (50 c.c.) is diluted with water to 500 c.c. and poured into a tap funnel fitted with a wire cloth sieve. The tap is then opened and the volume of water collected at equal intervals of time (1, 5 or up to 30 seconds) is noted. Curves plotted with volumes of water as ordinates and time intervals as abscissae then illustrate the degree of fineness of the pulp and its rate of draining on the paper machine wire. Provided the concentration of the pulp is constant, these curves are comparable with each other and afford an indication of the state of preparation of the stuff. When the concentration of the pulp is variable, the curves may be corrected to a standard concentration after a determination of the dry substance has been made.

Centrifugal Screens

If one has been in touch with progressive pulp and paper mills, he has noticed that their screenings systems have undergone the most radical changes within recent years. The screen rooms of many mills were, and not a few still are, places where the economy engineer has many suggestions to offer. In many mills a few years ago large rooms were crowded with Flat Screens which kept a crew of repair men busy almost continuously. To-day, when one enters some of these mills the noise of the screen room has vanished, where formerly the room was crowded with Flat Screens and where no place was left for other machinery, one can see to-day a row of Centrifugal Screens occupying only a small part of the room, but doing as much work as the former Flat Screens did. There is now enough room left for Wet Machines, Deckers, Conveyors, Pumps, etc.

There always was naturally a feeling against Centrifugal Screens. The Flat Screen is old and had been fully developed. The Centrifugal Screen was just coming into use. The designers had to learn. The best sign for its right to existence was the fact that numberless firms took up its manufacture. Their engineers and advisers saw that the future was coming to the exclusive use of the Centrifugal Screen. Despite the disadvantages of the many kinds on the market, they saw that the Flat Screens could never offer the economical features which the former have, and they knew that the Centrifugal Screen needed development.



In quite a few mills to-day we observe a new kind of Centrifugal Screen in apparance, quite different from the earlier makes. It looks very practical, and it works out as practical. The feed spout, outlet spout and drive are located where the practical mill man likes to have them. The engineers that recommend the installation of this Screen say it is the most convenient to set up, the mechanical advantages are remarkable, and the practical pulp and paper maker likes it better than other machines. This machine does not ignore the good features of the earlier types, all of which have some good points, but it embodies a combination of their advantages, the outcome of close observance of the various types and it eliminates the drawbacks which have been noted by experienced mill men who have used all kinds of types.

Everyone familiar with Centrifugal Screens knows their disadvantages. No one will dispute the drawback of a quarter turn belt, or a belt pulley on a vertical shaft, or the loss in power through steps or thrust bearings or packings, and the possible trouble resulting from the use of such apparently necessary means, or the bad influence which change in the stock supply has on many of the Centrifugal types of Screen, or the loss of time and money if the inlets or outlets plug up. Disadvantages such as these had to be overcome in the development of the Centrifugal Screen. Engineers and papermakers tell us that in the Improved Screen these drawbacks are eliminated, and that they believe it represents the Centrifugal Screen to which the future belongs. Standing in front of the machine one wonders at the nice and steady running without any noticeable vibration. It does not begin to shake if the stock comes thicker or in a rush.

The pulley is on a horizontal shaft and a plain straight belt drive can be employed. The runners are so arranged that the end thrust on the shaft that is common to other horizontal types is eliminated. There is no packing around the shaft or anywhere on the Screen. Inlet and outlets are arranged in a most practical way. The two ends of the machine are entirely free from spouts, and thus the machine and the bearings are easily accessible. It is quite a relief to the mill men to know that the Improved Screen is not going to give trouble if the stock comes too thick or all in a rush. The good stock will not then all be thrown out through the tailing spouts, and no step bearing is going to run hot.

The degree of screening can be adjusted through throttling of the shower pressure. It is possible to reject tailings more or less as desired. This makes this Screen especially valuable in front of newspaper machines or board machines. The plates may be revolved by means of a handwheel or a clutch if the machine is running. By lifting the top cover and revolving the screen drum, the plates may be easily inspected in one minute.

The Improved Screen does not embody one man's idea, but is designed through the assistance of first-class practical men, who have had years of experience with all kinds of Centrifugal Screens.

It may be successfully used for gound wood, sulphite, sulphate straw boards and all kinds of binder boards, news and wrapping. The centrifugal screen made by the Sherbrooke Machinery Co., has all these advantages and is one of the best on the market.

NEW BOARD MILL FOR MONTREAL.

The Montreal Boxboard Co. has been organized by Mr. O. A. Porritt, formerly General Manager of Price Bros. & Co., Ltd. Associated with him is Mr. J. R. Walker, the waste paper deal of Montreal, who is also interested in the National Paper Co., Valleyfield, Que., and the mill at Sault au Recollet. They are rebuilding the old buildings of the Montreal Woollen Co., on the Lachine Canal in Montreal.

Mr. Porritt will place the order for the board machine in a couple of weeks. It will be a six-cylinder machine and will have approximately fifty dryers.

They will manufacture chip board from the waste papers of Montreal, the supply of which Mr. Walker controls. It is their purpose also to make all kinds of pulp board, and patent coated board. Mr. Porritt's wide experience at Jonquiere Pulp Co. mill will ensure the success of his newest venture. The market in Montreal is sufficient to handle the entire output, which will be delivered by motor trucks. These same trucks will be used to gather the waste papers. Being on the Lachine Canal, the coal supply will also be obtained cheaply by water, and pulp can be delivered at the mill side by water.

UNITED STATES NOTES

(Special to Pulp & Paper Magazine.)

Business at the Anchor Mills Paper Company at Windsor Locks, Conn., is not very brisk at present, and preparations are under way for the shutting down of the plant. The owners are not particularly anxious to continue the business much longer, and have offered the mill for sale. They have received some offers for it, but not as much as they deemed it worth, so the bids were not accepted. It is planned now to work up such stock as is on hand and then shut down. Some of the employees have already obtained other employment in view of the uncertain nature of the mill. The plant is one of the oldest landmarks of the town, having been established first as a paper mill when the town itself was founded in 1854.

* * * *

The Case Board Company of Andover, Mass., which has not been running for several weeks on account of a broken cylinder on the engine, has completed the repairs, and is now operating full again.

* * * *

The White-Corbin Division of the United States Envelope Co., at Rockville, Conn., plans to erect an addition to its plant in West Main Street. The new structure will be 130 feet by 90 feet and will be located west of the present building. This Division is one of the largest envelope plants in the country. Nearly three million envelopes a day are turned out. The company employs about 165 hands.

* * * *

Waste paper is no longer wasted at the city hall at Detroit, Mich. Mayor Prince has purchased a paper-baling machine, and has installed it in the basement of the city hall. All the paper from the city hall, the police station and the municipal court is now brought to the basement of the city hall, instead of being thrown into the furnace or hauled to the dump. This paper is purchased by a local concern at 27 cents per hundred. The same company last week bought a big quantity of old books and records from the city for 25 cents per cwt.

* * * *

The annual meeting of the stock-holders of the United States envelope company was held in Portland, Me., last week. Waldo E. Buck, president and treasurer of the Manufacturers' Mutual Insurance Company, was chosen a director in place of Rred. H. Daniels, who died August 31, 1913. W. O. Day of Springfield, Mass., was chosen treasurer and Franklin C. Payson of Portland, clerk. All the other directors were re-elected. It was voted to amend the by-laws to read that the transfer books shall be closed for 14 days prior to any stockholders' meeting, instead of 10 days prior to the payment of any dividend.

* * * *

Charles Clugston, superintendent of the Baid division of the American Writing Company at East Lee, Mass., has resigned. Mr. Clugston has been in charge of the mill for six years. He went to Lee from Holyoke, and is a papermaker of much skill. It is not known definitely what his future plans are, but it is thought he will return to a position in Holyoke. Mr. Clugston is to be succeeded by George W. Bradburn, who is superintendent of the company's mill at South Lee and who will have the oversight of both mills.

* * * *

A building boom is imminent in the hustling paper making town of Rumford, Me., and it is expected that contractors will be busy before long in several undertakings. There have been rumors of an addition to the Oxford paper mill, and also to the new coated paper mill, but these rumors have not been substantiated as yet, although the addition to the Oxford mill is said to be a certainty at some near future date.

* * * *

The Composite Board Company of Niagara Falls, which went into the hands of a receiver several months ago, is expected to be reopened again under a firm financial basis in a few weeks. Edward Hill was president, and A. J. Kay secretary of the old company, and it is expected they will be retained at the head of the re-organized company. The receivers' foreclosure sale resulted in the purchase of the plant, equipment and stock by the Niagara Falls Power Company. Particular satisfaction is felt in paper making circles over the success of the company in reorganizing.

* * * *

The Racquette River Paper Company, of Posdam, N. Y., of which Geo. W. Sisson, Jr., is the president, is making new arrangements for the sale of its product, and has sent the following letter to its patrons:—Gentlemen:—With a view to keeping in closer touch with your needs and to give you better service, we have arranged to have Mr. Edwin P. Lindsay, of Boston, handle the sale of our papers. This arrangement will enabl us to devote closer attention to the manufacturing end and result in even greater uniformity and excellence of our product. Our mutual relations will be as direct and intimate as ever, and we shall visit our friends as opportunity offers. We confidently expect and bespeak for Mr. Lindsay and his selling organization, the same kind consideration that you have shown us in the past Yours very truly, The Racquette River Paper Company, (signed) Geo. W. Sisson, Jr., president.''

* * * *

On application of the directors of the corporation, Justice Andrews has granted an injunction restraining the prosecution of suits against the Battle Island Pulp & Paper Company of Flton, N.Y., granting the voluntary dissolution of the company, and naming F. B. Shepherd of Oswego as receiver. According to the petition there are $448,000 in notes against the company, the interest on the bonds has not been paid, and there is no cash on hand. The plant of the Battle Island Paper Company has not been running for over two weeks, and cannot be opened until an order of the court is obtained. If this is done, authority will have to be given the receiver to borrow money to carry on the business. Mr. Shepherd was placed under a $50,000 bond and at present will simply take charge of the receipts and disbursements. Unless it can be shown that the plant can be operated at a profit it will probably eventually be sold by the receiver.

The International Paper Co. is making an effort to make a grade of paper at Ticonderoga, N.Y., for Sears, Rosbuck & Co., that that concern has had difficulty in obtaining, and it is believed that success will crown their efforts. A number of mills have tried to make this paper, which is very light, weighing but twenty-two pounds to the ream, but have been unable to make stock entirely satisfactory to the big Chicago house. The Ticonderoga mill started making the paper two weeks ago and, while the right color has been obtained, the stock is not as yet to the required weight. It is believed, however, that this will soon be overcome. The mail order house will use ten thousand tons of the paper a year and, with another like this in prospect, it is certain that Supt. Mulroy, one of the paper company's expert and most experienced men, will make every effort to turn out stock that will meet the requirements.

* * * *

A delegation of Papermakers headed by W. R. Smith, vice-president of the International Brotherhood of Paper Makers, recently paid a visit to the general offices of the American Writing Paper Company at Holyoke, Mass., for a conference with General Manager Alfred H. Leeds, relative to the establishment of the three tour system in all mills of the combine. The company adopted the three-tour plan about two years ago, and all the mills of the combine, with the exception of the Massasolt, Holyoke, Linden, Parsons and two Riverside divisions have adopted the plant. The object of the conference is to find out whether or not the American Writing Paper plans to change over these mills, and when. Committees from each of the six mills are included in the delegation.

* * * *

Edward L. Rantoul, formerly of Salem, Mass., is among those prominent in the development of a million-dollar pulp company. A Massachusetts Charter was issued last week at the State House to the Androscoggin Pulp Company, capitalized for $1,000,000. Associated with Mr. Rantoul in the Corporation are James M. Wheaton and Richard S. Russell.

* * * *

The Columbian Paper Company, of Jackson, Miss., began the manufacture of pulp from pine wood last week. This is the first time the plant has ever undertaken to manufacture pulp from pine wood, although a little pine has at times in the past been mixed with other woods used in manufacturing the pulp There is a considerable amount of pine on the yards of the plant at Jackson, which will be used in experimenting with the manufacture of pulp from that wood.

* * * *

The New York Paper Company of Baltimore, Md., was sold March 16 to William Bauernschmidt. It is understood that the business and property was purchased for $18,000 cash. There was a mortgage on the building of $7,000, which was also assumed. The worth of the building is about $12,000 and the total inventory was supposed to be $33,000. This concern was purchased from the Whitehall Paper Company. The New York Paper Company dates back to 1898, it having been started then by Frederick Brinkman and continued by him until May 1913, which he formed a corporation known as the Whitehall Paper Company. This corporation acquired a mill at Whitehall, Md., and operated the mill in conjunction with the jobbing business of the New York Paper Company.

New Woods for Paper

(Special to Pulp & Paper Magazine.)

New York, March 25, 1914.

As announced last month in the Pulp & Paper Magazine the New York Herald printed an issue on paper made at the Government's experimenting plant in Wisconsin from wood other than spruce. It was desired to show that the life of the newsprint industry does not hinge on spruce alone. The severe practical test made by the Herald has been successful, as evidenced by the results and the evidence of the printers. Seventeen formulas have been tried out at the Forests' Products Laboratory at Madison, Wis., and samples of sheets from each of these seem to bear out the contention in favor of woods other than spruce. The formulas as given, are:—

		Furnish Lbs.
Sheet No. 1.		
	Spruce groundwood	750
	Hemlock sulphite	250
Sheet No. 2.		
	Western hemlock groundwood	750
	Hemlock sulphite	250
Sheet No. 3.		
	Sitka spruce groundwood	750
	Hemlock sulphite	250
Sheet No. 4.		
	Lodgepole pine groundwood	750
	Hemlock sulphite	250
Sheet No. 5.		
	Western yellow pine groundwood	750
	Hemlock sulphite	250
Sheet No. 6.		
	Balsam fir groundwood	750
	Hemlock sulphite	250
Sheet No. 7.		
	Cal. lodgepole pine groundwood	750
	Hemlock sulphite	250
Sheet No. 8.		
	Red fir groundwood	750
	Hemlock sulphite	250
Sheet No. 9.		
	White spruce groundwood	375
	Hemlock groundwood	375
	Hemlock sulphite	250
Sheet No. 10.		
	White spruce groundwood	375
	Balsam fir groundwood	375
	Hemlock sulphite	250
Sheet No. 11.		
	Tamarack groundwood	750
	Hemlock sulphite	250
Sheet No. 12.		
	Tamarack groundwood	375
	White spruce groundwood	375
	Hemlock sulphite	250
Sheet No. 13.		
	Noble fir	750
	Hemlock sulphite	250
Sheet No. 14.		
	Alpine fir	750
	Hemlock sulphite	250
Sheet No. 15.		
	White fir	750
	Hemlock sulphite	250
Sheet No. 16.		
	Engelmann spruce	750
	Hemlock sulphite	250
Sheet No. 17.		
	Amabilis fir	750
	Hemlock sulphite	250

New Superintendent of Forest Products Laboratories.

Mr. John S. Bates has been appointed Superintendent of the Forest Products Laboratories, to take the place of A. G. McIntyre, who has resigned to go to Bathurst, New Brunswick.

The choice of the Government is a most happy one, for it would be difficult to obtain a better combination of personality, training and experience, adapted to that work.

Mr. Bates was born at Woodstock, Ont., and is a graduate of Acadia University in arts and science. After leaving Acadia he went to Columbia University, New York, and graduated in chemical engineering, specializing in pulp and paper. He will be granted the degree of Doctor of Philosophy in June for work done on the chemical utilization of Southern pine waste at Columbia. Mr. Bates held the J. Pierpont Morgan scholarship in applied science, and was an assistant in quantitative analysis and industrial chemistry. In 1912 he was appointed Anthony Goldschmidt Fellow in Chemistry.

J. S. Bates

Added to all this training is the practical experience with the Union Bag and Paper Co. and Arthur D. Little, Inc., of Boston, Mass., from where he comes to Montreal.

We predict for Mr. Bates large success in his new work in this new institution, which means so much to Canadian papermakers. We also welcome him back to his native country, and feel fortunate that the possibilities of our young country are able to attract and hold men of such qualifications.

Ottawa Notes.

(Special to Pulp & Paper Magazine.)

Ottawa, March 30.—Among recent incorporations of Montreal pulp and paper firms at Ottawa are those of the Standard Pulp and Lumber Company, Ltd., incorporated with $1,000,000 capital and among whose incorporators are Messrs. Charles Beauchemin, Joseph A. Richardson and P. Lavigeur, all lumber merchants of Montreal, and the Montreal Box Board Company, Ltd., with $500,000 capital.

Of considerable interest to the trade is the announcement that a new method of cleaning paper currency has been adopted by the Canadian Finance Department after long experimentation. The fact that bank notes carry germs has long been recognized and for some time the Department had been trying various methods of disinfectiong these notes without injuring the paper of which they are made. It was found that about 20,000 living bacteria infected the ordinary Dominion note after it had been in circulation for some time the notes containing a fatty extract which tended to retain for an indefinite period any infection.

The first tests were made with formaldehyde gas and it was found that this was effective as far as the germs were concerned, but that the gas left poisonous effects. Heat was then tried, the notes being subjected to a uniform temperature of 80 degreees centigrad for four hours and this was found completely successful, the germs being killed and the paper remaining uninjured, even after an exposure of five days.

The question of the discharge of paper mill effluents into navigable waters which, as already mentioned in this correspondence, has been occupying the attention of Parliament this session in connection with the general question of pollution, has been referred to a committee which will hear evidence in this regard during the remainder of the session. Two bills, which have been introduced in regard to pollution, one by Mr. George H. Brabury, M. P., and the other by Senator Belcourt, both of which are somewhat drastic measures, were referred to the committee. During the discussion on the motion to deal with them thus, Sir Wilfrid Laurier, leader of the Opposition, urged that Parliament take action at once, and mentioned the fact that the House had years ago had considerable trouble with the lumber and paper mills on the Ottawa River with regard to the same question and had eventually gained its contention as a reason why it should brook no delay now. The Government, however, considered it wise not to be too summary.

While tales of valuable finds of diamonds and other valuables among the rubbish in paper mills are not uncommon it is seldom that such good fortune descends upon a worker therein as has fallen to the lot of Jeremiah Larocque, of Hull, an employee in the paper mills of the E. B. Eddy Company. Larocque has been notified that an uncle in California, recently deceased, has left him $1,500,000 and has gone to claim the sum.

Fraser and Company, the large lumber firm which has announced its intention of transferring its plant from its present site at Aylmer, Que., a few miles from here, will go to Grand Lake Victoria, Quebec., it is learned. A milling company is being organized to take over the mill while its limits on the Ottawa, Black and Coulonge rivers will be sold, including 500 square miles of timber and pulp wood altogether.

The Colonial Lumber Company of Pembroke has purchased from the J. D. Fraser estate, Ottawa, 200 square miles of pine and pulp wood with a twenty-mile frontage on the Ottawa River, near the Des Moines. The limit is so conveniently situated that the timber can be brought down to the company's mills in a day.

Inside a week the Finance Minister, Hon. W. T. White, will bring down the Budget in Parliament, and this will clear the decks for a tariff discussion. That there will be no change in the schedules as affects lumber, pulp or paper, may now be stated as a practical certainty, although Western deputations have asked for the former.

CANADIAN FOREST PROTECTIVE ASSOCIATION.

(Special to Pulp & Paper Magazine.)

Ottawa, Ont., March 25.—Following the example of Quebec lumbermen and paper manufacturers, members of both trades in Ottawa district have taken steps towards the establishment of what will be known as the Canadian Forest Protective Association, a body which will be largely along the lines of that organized some years ago in the St. Maurice Valley for the protection of limits there.

Two meetings have already been held and at the last one, held last week, a committee was appointed to undertake the work of organization. It consists of Senator W. C. Edwards, of the W. C. Edwards Lumber Company, of Ottawa; Mr. J B. White, of the Riordon Pulp and Paper Company; Mr. R. M. Kenny, of the James MacLaren Company, of Buckingham; Mr. Geo. H. Millen, of the E. B. Eddy Company, and Mr. Ward C. Hughson, of Gilmour and Hughson, of Ottawa.

It was decided that the plan of organization will include the appointment of a manager, under whom will be four inspectors and that these in turn will direct a staff of rangers. On all commanding positions lookouts will be established to give warning in case of fire and telephones will be installed throughout the different limits whose owners are members of the association. The railroad lines throughout the limits will also be patrolled and by all these means it is hoped to very greatly reduce the loss from forest fire, now so great.

Among the firms which were represented at the last meeting were: The Riordon Pulp and Paper Company, represented by J. B. White, Charles Read and John Gwynne; Messrs. George H. Mille‸and J. F. Rochester, of the E. B. Eddy Company; Senator Edwards, Gordon C. Edwards and J. A. Cameron, of the W. C. Edwards Company; P. C. Walker, of Shepard and Morse; Sir H. K. Egan, of the Hawkesbury Lumber Company; J. C. Brown, of Fraser and Company; J. H. Black, of J. R. Booth and Company; E. J. Graham, R. M. Kenny and J. E. Rothery, of James MacLaren Company.

NO SULPHITE SPIRIT IN NORWAY.

According to the Tidsskrift for Papirindustri, the fact that Norway differs from Sweden in doing nothing to utilize the waste lyes from its important sulphite pulp factories is due to the fact that they have no capital for the erection of the necessary plant. During the last two years, according to Stock Exchange reports, of the Norwegian sulphite pulp factories which do not use their product themselves for paper-making, only three have paid any dividend. The cost of plant for making alcohol from the waste lyes is very considerable, and the return is said to be slow.

UNION BAG.

Canada plays a more or less important part in the policies of the new management of the Union Bag and Paper Co. of New York. The policy of the present management is first to attempt to restore the injured credit of the company, and the initial step towards this is to pay its debts. Following this, unproductive properties must be made productive or sold, and certain of the manufacturing plants must be modernized. These details are set forth in the annual report just out.

Union Bag reports net earnings of $534,535 and a balance, after interest, sinking funds and depreciation, of $50,082. This result compares with a deficit of $287,007 in 1912, after paying the preferred dividend. The company in 1913 earned .45 per cent on the $11,000,000 preferred against .39 per cent on the same stock in the previous year.

The company's principal financial difficulties in the past have been due to dissipation of its financial resources in the purchase of an obsolete mill at Hudson Falls, N.Y., at a cost of $1,000,000, and the construction of a wood-pulp mill at Cape Magdalene, Quebec, at a cost of over $500,000. This mill is practically useless for lack of power with which to operate it, and the absence of a newsprint mill to consume its product.

At the close of the fiscal year, January 31, 1913, the company's unsecured bank indebtedness in Canada was $382,500. It was, at the close of the fiscal year, January 31, 1914, $340,000. Liquid assets in Canada are as follows: Inventories $1,066,363, accounts receivable $67,642, making a total of $1,134,000. The directors state that by arrangement with the company's Canadian bankers they are content to have these loans liquidated by a gradual conversion of inventory.

Mr. John S. Reigel, the president, states that the company "must also strengthen itself to meet conditions arising out of the prohibition of pulpwood export from Canada and the recent tariff action of the U.S. government."

BAMBOO PAPER IN BRAZIL.

A small paper mill, belonging to the Companhiu Fabrica de Papel and Papellao, at Porto Alegree, Rio Grande do Sul, Brazil, makes about 400 tons of wrapping annually. About two-thirds of this is made from bamboo, the rest from wood pulp, but the two are used separately.

As they find it cheaper to make paper from bamboo than from wood pulp, they contemplate disusing the latter altogether. With this end in view, they have made bamboo plantations close to the mill, which in two or three years' time will obviate the necessity of using any wood pulp at all. On the initiative of the German potash syndicate, a part of these plantations has been manured with potash salts, with the result that that part grows faster than the rest, and produces stronger plants.

Of course, bamboo paper is neither so strong nor so good-looking as ordinary wood pulp paper, but it is quite good enough for many purposes. As it can be sold cheaper, on account of the tariffs, than imported wrapping papers, it finds a ready sale in the country of its origin.

ASSOCIATION OF JAPANESE PAPER MILLS

(Nippon Seishi Rengokai.)

Brief Sketch of the Organization.

The history of the Nippon Seishi Rengokai dates from 1880, in which year it was first organized by the Oji Paper Manufacturing Co., the Yukosha Paper Co., the Kobe Paper Mill, the Mita Paper Mill and the Osaka Paper Mill, the principal object of the organizers being to fix from time to time the selling prices of their products by agreement. The system, however, did not work satisfactorily, and the impracticability of the original plan was realized after trying it a year or two. The Association was therefore converted gradually into an organ for social intercourse. The by-law has since been amended two or three times. The Association, which considers matters of general interest to the paper industry of Japan, is at present an important organ for promoting the welfare of its members. Statistics of production, imports and exports are published in the Association's official Magazine, which contains among other things, articles on various subjects relating to paper. Practically all the manufacturers of European paper in Japan are members, whose names are as follows:—

Oji Paper Manufacturing Co., Ltd., Tokyo.
Fuji Paper Co., Ltd., Tokyo.
Mitsubishi Paper Mille Co., Takasago, Hiogo.
Kiushi Paper Co., Ltd., Matsukuma, Kumamoto.
Yokkaichi Paper Co., Ltd., Yokkaichi, Miye.
Chuwo Paper Co., Ltd., Nakatsu, Gifu.
Kokura Paper Co., Ltd., Kokura, Fukuoka.
Tokyo Itagami Co., Ltd., Tokyo.
Umezu Paper Co., Ltd., Kyoto.
Noda Paper Mills, Osaka.
Nakanoshima Paper Co., Ltd., Osaka.
Yukosha Paper Co., Ltd., Tokyo.
Kiso Kogyo Co., Ltd., Kiso, Nagano.

The total capital invested by these 13 members in their enterprises amounts to about 30,000,000 yen, and the number of mills owned by them is 20. In addition to 54 machines actually running, there are three or four new ones in the course of installation. Besides the Government Paper Mill, which is not a member of the Association, there are some manufacturers who remain unaffiliated. They are, namely, the Toyo Paper Co., Ltd., of Osaka, which manufactures cigarette paper exclusively, the Teikoku Paper Co., Ltd., whose mill is now in the course of construction in Osaka, and eight concerns manufacturing straw-boards.

Production of Paper in 1913.

The total production of European paper (except straw board) in 1913 by the thirteen principal concerns constituting the Association of Japanese Paper Mills may be compared below with the figures for the two preceding years.

	Lbs.
1913	295,892,821
1912	251,377,312
1911	243,204,346

The increase of production in 1913 over that in 1912 amounting to about 18 per cent is due chiefly (1) to the marked increase of output at the Tomakomai Mill of the Oji Paper Manufacturing Co., where some equipments were improved, and (2) to the admission to membership of the Kiso Kogyo Co., whose mill commenced operation in January, 1913.

The production in 1913 may be classified below according to the grades of paper manufactured:—

	Lbs.
Printings	96,332,282
News Printings	125,953,117
Simili	8,148,159
Imitation Japanese	10,112,556
Match.	9,328,833
Coloured	4,703,959
Wrappings & Packings. . .	17,679,198
Imitation Chinese	7,857,204
Miscellaneous	15,782,613
Total.	295,892,821

Owing to the changed classification adopted in January, 1913, the statistics given above can not be compared with those for the preceding years.

Imports of Paper in 1913.

Various grades of paper imported into Japan during the year 1913 may be compared below with the statistics for 1912.

N.B.—In the following statistics, which have been copied from a Government report, the unit of weight is "Kin" equivalent to about 1 1-3 lbs.

	1913.		1912.	
	Quantities. Kin.	Values. Yen.	Quantities. Kin.	Values. Yen.
Printings, weighing not more than 58 grammes per square Metre	9,496,645	840,664	6,442,323	598,345
Other printings	23,293,764	2,704,610	20,870,090	2,360,278
Writings	2,573,298	443,508	2,250,308	465,224
Drawings	649,299	147,279	1,338,098	247,071
Packings and Wrappings	7,579,422	690,442	5,079,824	453,675
Match Paper	1,247,838	110,987	1,811,855	158,803
Cigarette Paper	2,656	892	6,184	1,795
Pasteboard or Cardboard.	4,819,232	392,969	4,075,879	413,306
Chinese Paper	333,537	67,426	237,187	48,383
Imitation Japanese and Tissue	7,541,012	798,574	12,597,254	1,292,141
Imitation Parchment, Paraffin, and Wax Papers	1,369,897	209,892	1,175,002	181,502
Other Papers	2,898,671	830,231	2,991,557	887,420
Total	62,505,271	7,237,474	59,476,061	7,113,943

The total value of paper imported in 1913 shows an increase of 123,531 Yen over the figures for 1912. Of the items showing increase or decrease, the principal ones may be mentioned. The growing demand for printings of higher grades is reflected in the statistics of printings weighing less than 59 grammes per square metre and of those coming under "Other Printings"; the increase amounts to some 243,000 Yen and 344,000 Yen respectively. Attention may be called to the imports of packings and wrappings, which show an increase of 236,000 Yen over the figures for 1912. Compared with the figures for 1911, the increase amounts to 410,000 Yen. This singular tendency may be accounted for by the fact that the manufacture of packings and wrappings in home mills does not increase in proportion to the growing popularity of these lines all over the country for wrapping up things. The decrease of 48,000 Yen shown under match paper is due to the increased production by the Japanese manufacturers. A reference may be made to the Toyo Paper Co., which is not a member of the Association of Japanese Paper Mills. That company supplies nearly the whole of its output to the Government Monopoly Bureau, and the imports of cigarette paper have decreased to such an extent that it hardly deserves an independent item in the statistics. Attention may also be called to the decrease of some 500,000 Yen shown under imitation Japanese and tissue paper, which is due to the marked increase of home production stimulated by the revised tariff.

Pulp Trade in 1913.

The statistics of pulp imported into Japan during the past three years are as follows:—

	Quantities. Kin.	Values. Yen.
1913	78,761,780	4,630,477
1912	76,904,983	4,379,861
1911	53,688,559	2,756,518

In the customs returns published by the Government, pulp is divided into two classes, viz.: "Mechanical Pulp" and "Others." It may, however, be pointed out that mechanical pulp imported during 1913 is about 2,000,000 Kin, the value of which does not exceed 100,000 Yen. Under "Others," the quantity of soda pulp is so insignificant that sulphite, both bleached and unbleached, constitutes by far the largest part. The remarkable increase of sulphite pulp is an evidence of the recent expansion of the paper industry in Japan. The present tendency of the pulp trade will remain unchecked until a pulp mill or two now being erected in Karafuto (Japanese Saghalien) can put their products on the market.

Paper Trade in 1913.

After the close of the war with Russia (1904-5), the principal paper companies in Japan either extended their mills or erected new ones by increasing the capital. Upon completion of these works, some grades of paper turned out by different mills began to flood the market. At the same time, the manufacturers had to face keen competition with foreign goods, which resulted in dull trade covering a period of several years. It was in 1912 that the market began to show signs of improvement, owing to the active demand for the products of home mills. The year 1913 opened with greater activity; various mills brought up-to-date were operated in full swing. It was, however, realized that their capacity was getting inadequate for the growing demand. It is quite natural that, under these circumstances, several companies should have decided to extend their plants, some of which have already been completed. A sudden set-back was experienced in the summer of 1913, and considerable dullness of trade prevailed in the autumn, which is usually a season of brisk business. Towards the close of the year, all the mills were more or less overstocked in all lines except news printings. It is, however, the importers of paper that sustained the severest blow. In spite of dullness that prevailed during 1913 in the paper trade of Japan, the profits of the paper manufacturing companies for the second half of that year compare favorably with those for the first half. It is a general belief that the Exhibition to be held in Tokyo in the Spring of 1914 and the Coronation that is to take place in Kyoto in thefall with stimulate the demand for various lines of paper and improve the markeet.

THE DETERMINATION OF THE KIND OF LOADING MATERIAL IN PAPER.

The kind of loading material in paper is determined at the present day, generally speaking, by chemical analysis of the ash, and partly by microscopically observing the shape and size of the particles of ash. The former method is troublesome and the latter unreliable. Other investigators have already noticed that loading materials are colored in various ways with aniline dyes. Formerly the coloration took place either under the microscope or in the beater. The method proposed here consists in moistening the pure white, glowed ash of the paper, as obtained when determining the quantity of loading material, with a mixture of a basic and an acid colored solution, allowing the solution to act for some time, and then sucking away the excess liquid laterally with a piece of blotting paper. The ash to be investigated is preferably put on to an object glass, a drop of the colored mixture is allowed to gall on it, both are mixed with a needle, and the mixture spread out on the object glass. The loading material precipitates the dye most nearly related to it out of the solution and the supernatant liquid is sucked away laterally with a piece of blotting paper. If methylene blue has been used as basic dye and azo acid red as acid dye, for example, the ash is coloured distinctly blue after the excess liquid has been drawn off and the ash has been dried if kaolin, talc or asbestine are present, and distinctly red if barium sulphate or plaster of Paris have been used. Two groups are thus obtained which are separated further as follows. If the dry spot on the object glass is blue, place a drop of cobalt nitrate solution on a small piece of the paper under investigation and hold the same in a Bunsen burner flame until the paper is completely white; if a blue spot (Thenard's blue) is formed kaolin may be assumed. Asbestine and talc are distinguished under the microscope owing to the former showing long slatelike or flakey fragments of fibrous stratum.

If the ash become colored red, in the event of plaster of Paris being present this can be readily recognised by the characteristic crystals of gypsum which form particularly at the edge of the spot. Blanc fixe dissolves when heated in sulphuric acid, and on cooling beautiful crystals separate out. Carbonates can be best determined by adding acids under the microscope and observing the espace of carbonic acid and the shape of the crystals which form.—Papier Fabrikant.

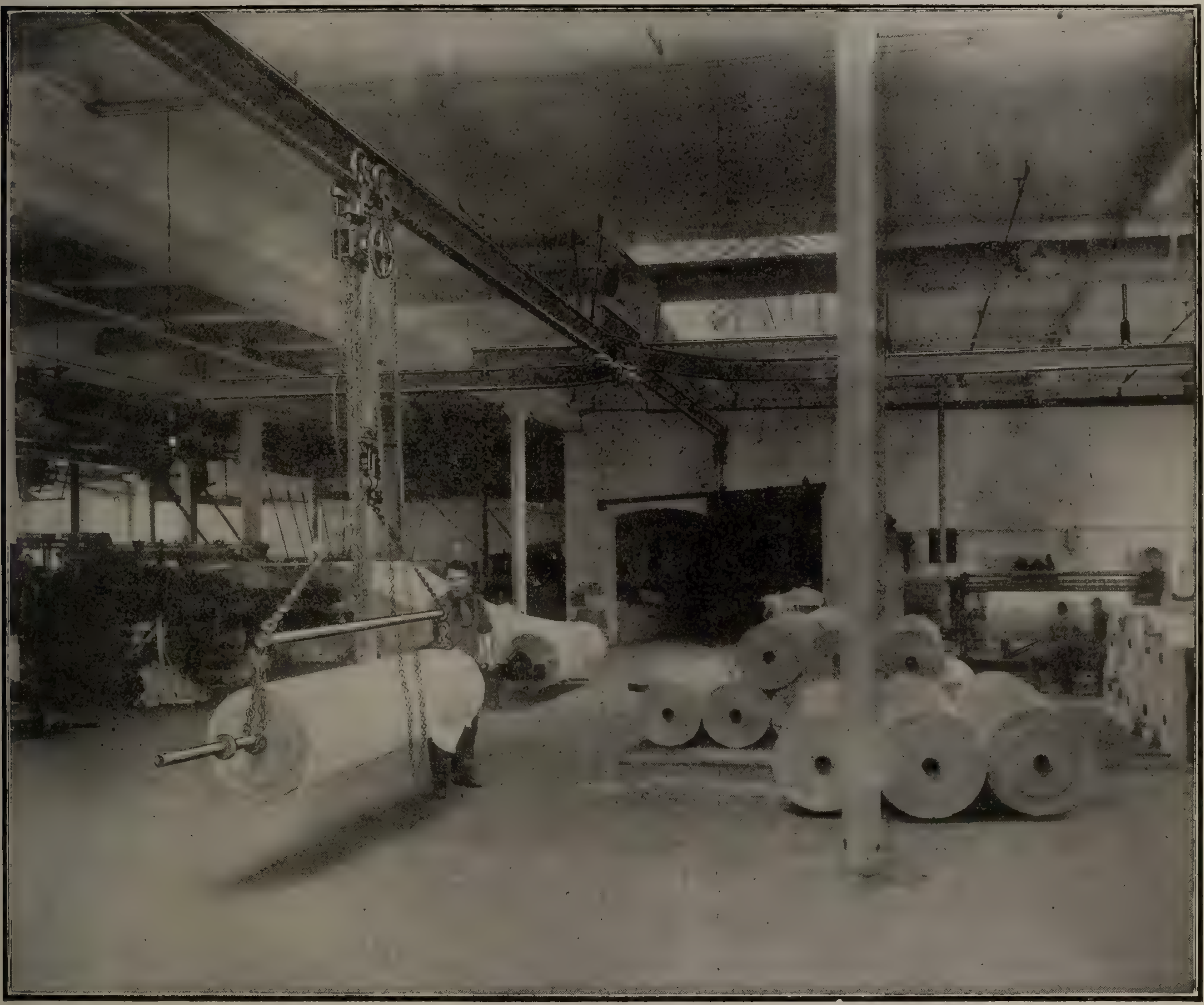
HANDLING ECONOMY.

The accompanying illustration is reproduced from a photograph taken in the new mill of the Rolland Paper Co., Limited, at Ste. Adele, Que.

Every papermaker knows how cumbersone and unwieldly to handle is a roll of paper, and how much "broke" inevitably accumulates every time a roll of paper is removed from a machine or transported from point to point in the mill .

The man in the picture is carrying a load of three thousand pounds unaided, and he has it under such perfect control that he can pick up the roll, move it away at a brisk walk and deposit it on the top of the pile without calling anyone to help him.

The Rolland Paper Company is to be congratulated on its farsightedness in putting in the Morris Overhead Runway which has made this economy possible. We understand that the runway which is an installation of considerable size has already paid for itself in the saving of waste, time and labor.



Rolland Paper Co.

FORESTRY CONVENTION FOR HALIFAX.

It has been decided that the 1914 Forestry Convention is to be held in the fine old city of Halifax, and the date definitely decided upon is Wednesday, Thursday and Friday, September 2, 3 and 4.

The friends of the forest in Nova Scotia have been urging the claims of Halifax for six or seven years, and members of the Canadian Forestry Association in other provinces have backed up the effort, but until now the claims of Central and Western Canada proved too strong.

This time, however, the Government of the province and the lumbermen united in a strong invitation, and, at the annual meeting, this invitation was accepted, and Mr. F. C. Whitman, Annapolis Royal, N. S., who has for many years, both as a director of the Association and as a lumberman, worked for forest conservation, was elected Vice-President. Mr. William Power, M. P., of Quebec, the new President, also believes that it is now the turn of Nova Scotia for a meeting.

There has never been a convention more generally accepted than this one, and everything points to one of the most successful and useful conventions in the history of the Association. Halifax, with its many attractions, historic, scenic and commercial, is one of the great convention cities of Canada.

THE INVESTIGATION OF ROSIN SIZE

Normally composed rosin size can be investigated both gravianalytically and also titrimetrically. According to Dalen the following simple analytical method is recommended, by which the total quantity of the rosin, the bound and the free rosin, as well as of the alkali is titrimetrically determined. For exact analyses the total rosin will be determined gravimetrically.

2—3 g. rosin size are dissolved in about 25 c.cms. hot water, the solution is poured into a separating glass of 300 c.cms. capacity and mixed therein with 50 c.cms. 1-10 standard sulphuric acid. The precipitated rosin is agitated with ether, and the aqueous solution run off without loss into a second larger separating glass; the etheric rosin solution is washed a second time with water and the washing liquid is added to the aqueous solution obtained first. The entire aqueous liquid is then shaken again with ether and finally poured into a flask. The unused sulphuric acid is titrated back in this with 1-10 standard soda lye. If m. c.cms. alkali were employed for the titration then 50 — n c.cms. acid have been used for neutralising the alkali contained in the rosin soap. The composition of the soap is then calculated as follows:—

(50 — n) 0.0031 = percentage of alkali calculated as Na_2O in grammes.
(50 — n) 0.0302 = percentage of bound colophonic acid (molec. weight 302) calculated as hydrate.
(50 — n) 0.0293 = percentage of bound colophonic acid calculated as anhydride.

For the purpose of ascertaining the free colophonic acid and the non-saponifiable rosin constituents the etheric solutions in the two separating glasses are united, the total rosin contained therein being tirated with 1-10 standard alcohol lye in the presence of phenolphthalein. If m. c.cms. have been used for titrating the rosin, then, as 1 c.c.m. 1-10 standard lye corresponds to 0.034 g. rosin (colophonic acid + nonsaponifiable eosin), as found by experience,

m. 0.034 = the percentage of colophonic acid and non-saponifiable matter (total rosin),
m. 0.0302 = the percentage of colophonic acids,
m. (0.034 — 0.0302) = m. 0.0038 = non-saponifiable rosin.
0.0302 (m. + n — 50) = free colophonic acid.

The mode of testing described by Dalen is intended for the investigation of normally composed rosin size. Special methods of investigation are required for testing those kinds of rosin size of which many have recently been put on to the market and which contain, besides rosin and sodium rosinate, other substances exercising an entirely different sizing action. Of these, animal size (glue, glutin), vegetable size (paste) casein, albumen, starch, dextrin, gummi arabicum may be specially mentioned. Owing to the presence of those substances the investigation of rosin size is rendered considerably more difficult. As a rule, the desired goal is reached as follows:—first test the solubility of the size in alcohol. Normally composed rosin size dissolves even when cold, whilst the above mentioned admixtures are all insoluble in alcohol and can therefore be readily separated and quantititatively determined. For more exact determination, test the matter insoluble in alcohol as to the percentage of ash in the first place, because any loading materials such as clay, heavy spar, etc., which have been added for adulterating the rosin size, do not dissolve in alcohol. If ash is lacking heat a test with potassium or sodium in an incandescent tube (Prussian blue reaction) for testing as to nitrogen.

Two cases are then possible:—

1.—The Substances Insoluble in Alcohol are Free from Nitrogen.

In this case, glue, albumin and casein do not come into question, but starch, dextrin and gummi arabicum.

Starch will be met with most frequently. This can be detected at times microscopically by its characteristic shapes, and always by the occurrence of a deep blue color when treated with iodine solution. The starch can be separated approximately quantitatively in cold water from dextrin and gummi arabicum owing to its being dissolved only with difficulty. Thus when treating 3 g. of a mixture of equal parts of wheat starch, dextrin and gummi arabicum with 300 c. cms. cold water about 0.9 g. were recovered undissolved. A proviso for employing the separation method is, of course that so-called soluble starch is not present. This is not met with, however, as an admixture with rosin size. Dextrin and gummi arabicum can be distinguished by their behaviour relatively to lead-vinegar. Gummi arabicum is thrown down as a lumpy precipitate, whilst dextrin remains in solution.

2.—The Substances Insoluble in Alcohol Contain Nitrogen.

In this case attention must primarily be paid to animal size (glue, glutin). More rarely will vegetable size with albumin or casein be met with. For recognizing the nitrogenous substance test its behaviour in the presence of water and acetic acid. Glue is completely dissolved in water, the solution is not precipitated by acetic acid in contradistinction to the other products either when cold or hot. The percentage of nitrogen in the animal size is, as a rule, about 18 per cent and that of sulphur is trifling (0.2 to 0.25 per cent.) When heating with alkaline solution of oxide of lead sulphide is not separated, as is characteristic for vegetable size, albumen and casein. Animal size forms with tannin a double compound soluble with difficulty in water.

Albumin (egg albumin) is soluble in cold water just as glue is but is precipitated when heated, particularly after adding acetic acid.

Vegetable size (paste and casein do not in themselves dissolve in water, but only in the form of their alkali compounds. These are decomposed by acetic acid, albumin free from alkali being separated. Casein differs from all the other albumins by its considerable percentage of phospherous (about 0.8 per cent.) and being able to be precipitated by rennet.

It nitrogenous constituents have been detected in a rosin size in the above manner, adhesive substances free from nitrogen, such as starch, dextrin and gummi arabicum may, of course, be present in addition. Of these, starch is recognized most readily by the iodine reaction. For the purpose of testing for dextrin and gummi arabicum the nitrogenous compounds must first be precipitated by an excess of tannin solution. The precipitate is filtered off, the filtrate evaporated to dryness and put into a few cubic centrimetres of water. Small quantities of the insoluble double compound of tannin are separated. These are removed and the aqueous solution is mixed with an abundant quantity of alcohol. The excess tannin is dissolved in the latter, whilst dextrin and gummi arabicum are precipitated.

The precipitation is more clearly characterised after dissolving in water by means of lead-vinegar (cf. above).

If no precipitate is obtained on adding alcohol, but at most a slight turbidity then dextrin and gummi arabicum are lacking. If the constituents insoluble in alcohol have been separated from a rosin size and tested in the described manner then it is necessary only to test the portion which is soluble in alcohol and which consists as a rule only of rosin and rosinate of soda. This investigation is performed in the customary manner and causes no difficulty.

BROWN WOOD PULP.

Among the new methods recently proposed for brown pulp without resorting to the grinding process, which requires great power, the roller crushing process of Rudolph Kron (Austrian Patent 54,166) deserves special mention. It is well known that the ordinary mechanical process with steamed wood consists in a combined grinding and crushing action entailing much loss of power by friction. It also makes too much waste in the shape of very small fragments.

The Kron process consists in passing the steamed wood between rollers lying across the grain, and it seems likely to replace the older methods as effectually as the roller has replaced the millstone in grinding corn. The rollers reduce the wood to fibres which have lost all their hardness and stiffness, so that they will make good pulp even out of the hardest woods.

The necessary succession of roller pairs is contained in a machine called the softener. The rollers are made of the best chilled cast iron, and the rollers of each pair are at adjustable distances from each other. The material is fed continuously to the uppermost pair, and leaves the lowest pair ready for the pug mill, whence it goes direct into stirring vats, and is then sorted and refined exactly like ordinary mechanical pulp, and passed to the draining machines.

The advantages of the new method as compared with the older processes may be summed us as follows:—(1) Smaller power is required. While the production of 100 kg. of dry pulp requires from 6 to 8 horse-power by the old process, according to the character of the wood, only half that power is needed, under the same circumstances, in the Kron machine. (2) The quality of the product is better, as shown by microscopical tests. (3) The Waste is less, as the machines does not anticipate the work of the beating machine. (4) The process is more equally adaptable to various sorts of wood While big pieces are wanted for grinding, the Kron process can be appiled to all sorts of pieces, big and little. (5) The running expenses are less. In the Kron method the same man can look after the softener and the pug mill. Thirty horse-power will give 5,000 kg. of dry pulp per twenty-four hours. (6) The expense of sharpening and renewing grindstones is, of course, entirely avoided.—Zentralblatt.

MR. C. B. THORNE SAILS FOR EUROPE.

Mr. C. B. Thorne, manager of the Hawkesbury mill of the Riordon Pulp and Paper Co., Ltd., sailed for Europe on March 31, from New York.

It is the policy of the Riordon Co. to send a man to Europe every three or four years. Mr. Thorne will remain there four months studying conditions and new methods in Germany, Scandinavia and England.

SULPHUR CONSUMPTION IN SULPHITE.

It is a common practice to estimate the sulphur consumption in pounds per ton of finished pulp, and as the figures vary unreasonably in different factories, even in view of the fact that different woods require different amounts of sulphur, according to their content of cellulose. It appears that the average consumption in America is 280 lbs. per ton, the limits being 235 lbs. and 400 lbs., and the average elsewhere is about the same.

The question has been investigated by Mr. O. F. Bryant, the chemist of the Nekoosa Edwards Paper Co., Port Edwards, Wisconsin, who tried to determine irreducible minimum quantities of sulphur, provided no sulphur is lost. He was led to the conclusion that the indispensable part of the sulphur is that which combines with the lignine of the wood. Hence he had to determine how much sulphur the waste lye contained in the form of organic sulphur compounds, and also to compare the amount of the lye with the quantity of pulp produced. The factory in which he carried out his researches makes unbleached pulp from fir in boilers 42 feet high and 13½ feet in internal diameter.

A charge gives 16,000 lbs. of pulp and 25,000 gallons of waste lye. An analysis of the latter gave the following figures:

	Grammes per Litre.	Pounds per ton of Pulp.
Total solid residue	115.00	2,999
Loss by combustion of same......	105.36	2,748
Leaving ash	9.64	251
Total sulphur	7.83	204
Sulphur as SO_3	0.76	20

Composition of the ash:

	Grammes per Litre.	Pounds per ton of Pulp.
CaO	2.98	78
MgO	2.75	72
S	1.76	46

The specific gravity of the lye was 1.0425.

As the lye contained 204 lbs. of sulphur per ton of pulp, of which 20 lbs. was in the form of sulphuric acid, there were 180 lbs. of organic sulphur compounds in the lye per ton of pulp. If we had to regard the formation of SO_3 as essential, we must consider that the minimum of sulphur here indicated per ton of pulp is 204 lbs. Such, however, is not the case. The SO_3 is not formed during the boiling, and is only an accidental accompaniment of the process. This makes the 20 lbs. a loss, and reduces our minimum to 184 lbs.

Probably, this minimum is never reached in factory working, but many pulp mills ought evidently to be able cut down their consumption of sulphur considerably by paying attention to its combustion, and all the other details connected with its use. A factory that uses 400 lbs. instead of the theoretical 184 will surely find great difficulties in dealing with its waste lyes, and thus there is another powerful argument in favor of using less sulphur. It is undoubtedly possible to get far closer to 184 lbs. than 400 lbs. Even the 280 lbs. must be regarded as excessive and wasteful.

In the little country of Denmark there are 230 pulp or paper mills. In Canada, according to the latest available statistics of the Dominion Foresty Branch, there are only 48 pulp mills in actual operation. The Canadian mills are, however, many times larger than those in Denmark.

NEW PATENTS

Fluid Stuffing Box.

By George Ernest Miller, of Madison, Maine, Patentee.

U. S. Pat. No. 1,073,273.

This invention relates to paper making, and more especially to cylinder machines; and the object of the same is to produce an improved stuffing box made in sectors which when assembled will inclose the extremity of the cylinder so as to prevent leakage of water and waste of the fibres and yet to avoid friction on and wear of the cylinder itself. This and other subjects are accomplished by constructing the stuffing box in the manner hereinafter more fully described and claimed, and as shown in the drawings wherein—

Figure 1 is a longitudinal section through one end of the vat, with the cylinder, couch roll, and stuffing box in elevation; Fig. 2 is a cross section on the line 2—2 of Fig. 1; Fig 3 is an enlarged longitudinal section through all parts assembled.

In the drawings I have illustrated my invention in connection with the cylinder of a paper making machine, although I do not desire to be limited to this use of the same. Such a machine as ordinarily constructed includes a water vat V having upright ends E through one or both of which are outlets O, and both of which carry bearings B which are rendered vertically adjustable by any suitable means such as upright screws U and bolts or screws for holding the bearing adjustably. In said bearings is journaled the axle A of a cylinder C having an open-work body surrounded by wire cloth W and reduced flanges F at its extremities each by preference mounted on a spider S which is ecured to the axle A as shown; and the couch roll R rests upon the Cylinder C and rotates it in the usual manner. As is well known to those familiar ith the art, the vat contains water carrying fibres n solution, and when the outlets are opened and water drawn off from the interior of the cylinder there is a certain current below the water level in the vat tending to carry the water and fibres towards and into the cylinder C, with the result that the fibres adhere to the wire cloth W thereon and are carried around to the couch roll or felt, by which they are moved from the cylinder and eventually formed into paper sheets in a manner not necessary to amplify. Various attempts have hitherto been made to prevent the escape of the water and fibres in the vat around the ends of the cylinder and out the outlet O without its being passed through the wire cloth W, and yet such stuffing boxes as have been made and employed in this connection either set up so much wear on the exterior of the cylinder that the wire cloth thereon is soon torn to pieces, or the braking action on the cylinder is so great that the couch roll will not rotate it with ease.

No novelty is claimed for the parts thus far described, but I have set forth below the details of a fluid stuffing box which I prefer to use in this connection although, as above suggested, it might be used elsewhere with equally good results.

Coming now more particularly to the details of the present invention, the stuffing box which I employ is by preference made of brass and in a plurality of sectors connected end to end by ears at their extremities through which pass bolts 1 as best seen in Fig. 2, each sector by preference having a boss 2 which is tapped to receive a pipe 3 through which fluid such as water may be fed into the same under pressure a little greater than the pressure of the water within the vat V. The advantage of making this stuffing box in sectors (of which two only are shown in Fig. 2) is that its sectors can be put in place within the ends E of the vats V and around the flange F of the cylinder C without removing the axle A of the latter from its bearings B. Assuming, however, that the sectors when secured end to end make up a complete ring, the body of the stuffing box is of the cross section best seen in Fig. 3 and comprises a collar 4 bolted at several points as at 5 to the end E of the vat and preferably having an internal shoulder 6 fitting over the extremity of the flange F on the cylinder C a flat body 7 closely surrounding but just out of contact with said flange F., and therefore producing no wear when the cylinder is rotated; and a channeled member 8, preferably formed integral with the body 7 and disposed between the edges thereof with its mouth 9 opening toward the flange F and its base 10 pierced at suitable points with openings communicating through the bosses 2 with the pipes by means of which the fluid employed is fed to the interior of this channel. Preferably such fluid is water, although whatever fluid is employed should

Fig. 1.

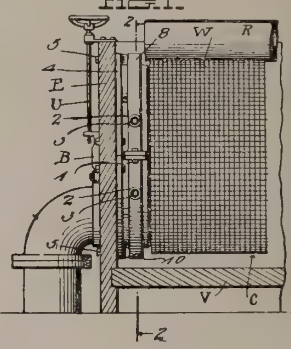


Fig. 2.

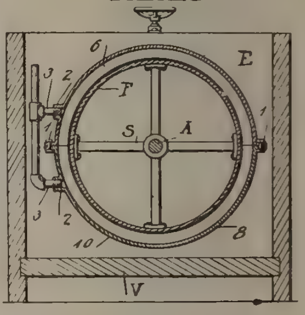
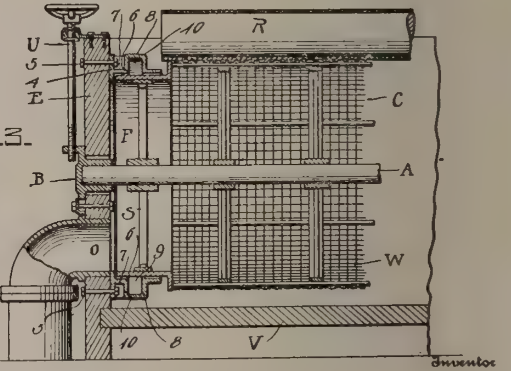


Fig. 3.



be under a little greater pressure than that in the vat. The cylinder is rotated by the means above described, or by any suitable means, and if the couch roll R rests upon the cylinder C its bearings B may need adjustment from time to time when they become worn.

In the use of this improved stuffing box, the parts are assembled by inserting the lowermost sector beneath the flange F and placing the uppermost sector above it, and connecting their ears by the bolts 1, and then connecting the flange 4 by the bolts 5 with end E of the vat. All this can be done without removing the cylinder from the vat, although doubtless it would be necessary to stop its rotation and withdraw the water from such shaft. When the parts finally assume the position shown in the drawings, the fluid is turned on through the pipe or pipes 3 so that it flows into the annular space within the channeled member or members 8, out of which it must and does leak slowly between the body 7 thereof and the exterior of the rotating flange F of the cylinder. But as the pressure of the fluid in this stuffing box is greater than the pressure of the liquid within the vat V, it will be impossible for any of said liquid to flowin a contrary direction, and if the fluid employed in the stuffing box is water the overflow thereof will mingle with the water and fibres in the vat without injury to the product.

Especial attention is directed to the fact that the parts of this stuffing box need not contact at any point with the flange F or the cylinder C, especially if the bearing B is properly adjusted, and if there is no contact there can be no friction and no wear, and the leakage referred to has been shown to be without objection.

What is claimed as new is:—

In a paper making machine, the combination with a cylinder having a concentric flange extending beyond its end and in communication therewith, of a vertical support located adjacent to the open flanged end of the cylinder, a bearing movably located within an opening formed in said support and adapted to be adjusted vertically, an axle passing through the cylinder with its end projecting beyond the flanged portion thereof and revolubly received by said bearing, an outlet passing through the support and communicating with the cylinder, a stuffing box surrounding the flanged end of the cylinder and including a body made of sections bolted together, said box being larger in circumference than the flanged portion of the cylinder, and means secured to the support for adjusting the bearing, whereby the flanged portion of the cylinder is accurately adjusted in respect to the stuffing box.

SULPHITE FIBRE.

Process for Making It from Resinous Woods Patented by Omar Carr, of Asheville, N.C.

Oma Carr, of Asheville, N. C., has been granted patent No. 1,089,691 on the manufacture of sulphite pulp from resinous woods.

Practically all resin-bearing woods store the greater part of their resin in thee "summer" ring of the wood, the rest being stored in the medullary rays, says the inventor. Wherever the resins are stored the cellulose is stained yellow or yellow brown. In many varieties of pine this stain is of such character that it does not dissolve out under the action of the sulphite "cook liquor," the stained fibres being only partially cooked and eventually showing in the pulp as "shieves" or "yellow shiners." These pines are not, therefore, available for pulp by the sulphite process in their natural state; and as they are very abundant, of rapid growth, and of insignificant value for lumber or fuel use, it is economically desirable to render them suitable.

It is the object of my invention to attack the "yellow ring," or stained fibres, before subjecting the wood to the sulphite cook, the desirable characteristics of which, as compared with the soda process, are well known. This I accomplish by the use of turpentine and alkali in combination. The resins causing the stains are complex in chemical composition, some being acid in nature and soluble in alkaline solvent, while others act as neutral resins and are soluble in turpentine.

An outline of one general method of procedure is as follows: The wood is chipped in the usual way and the chips placed in an autoclave (one of a series); they are then extracted by turpentine, a large part of the resins responding to this solvent, heat and circulation promoting the result. Following the turpentine extraction I place on the chips a solution of alkali (common soda ash is convenient, but caustic soda is more effective), and by heat and circulation remove the remaining resins. The extraction may be conducted with the autoclaves as a series, interconnected, or intermittently, the alykali solvent may precede the turpentine, or the two solvents may be used together, the turpentine emulsifying with the alkali solvent.

A specific procedure may be as follows: A battery, or series, of autoclaves is employed, preferably eight in number and interconnected by appropriate piping and provided with heaters and valves. Numbers one to six will contain chips submerged in alkaline solvent, numbers seven and eight chips submerged in turpentine solvent. By means of compressed air the solvent in number one is forced forward, a "draw" of alkaline solvent being taken from number six; simultaneously fresh turpentine solvent is forced into number seven and a "draw" of such solvent taken from eight. Then number one is "dumped" of its charge of "spent" chips. Number eight is now connected with number one, and by running fresh alkaline solvent into number two circulation is forced through the battery and turpentine solvent from number eight is forced over into number one, saturating the fresh chips there. The battery is now ready for compressed air in number two, a "draw" of alkaline solvent from number seven; fresh turpentine solvent into number eight, and a "draw" of turpentine solvent from number one. Thus the extraction proceeds, the fresh chips being bathed in turpentine solvent and the nearly spent chips bathed in alkaline solvent. The "draw" of alkaline solvent contains resins as soaps, and residual turpentine; the turpentine is recovered by appropriate distillation, and by evaporation the resin soaps are obtained. The "draw" of turpentine solvent contains resins, and by distillation of the turpentine the resins are obtained in the "free" state. Whatever turpentine is contined in the wood primarily, is collected and appears in the turpentine reclaimed.

The "spent" chips are practically free of resin and yellow stain, and after draining or drying may be cooked by the conventional sulphite process.

Obviously the process may be reversed, the alkaline solvent preceding the turpentine solvent, while it is also apparent that the two solvents may be merged together; and it is further apparent that the extraction may be conducted in an intermittent manner instead of serially. The specific procedure described above, however, gives best results.

NOTES ON FOREIGN TRADE.

Paper for Turkey.

A United States consular report states that there is a good demand for paper in the Harput district of Turkey, and it will increase as the people become more educated. In this region every scrap of paper, particularly newspaper, is saved carefully, as it can be sold or used effectively in many ingenious ways. It is estimated that about £3,000 worth of paper is used in this district each year, most of it imported from Belgium. The common paper for writing is thin, ruled and double-sheeted, 7 to 8 inches by 10, and costs from 5d to 1s 0½d per hundred. There is also in use, especially for writing Turkish, unlined paper, thicker and with double sheets, 8½ by 13 inches, costing from 7½d to 1s 8d per hundred. The experience with printing paper imported for the American College press at Harput has shown that it costs from 2d to 2½d per lb. to get such paper from America, not including the packing expenses in the United States or the customs duties of 11 per cent at the Turkish port of entry. Except for this press there is little demand locally for printing paper. Envelopes 4 by 5½ inches, of thin colored paper, cost from 4d per hundred up. There is a demand in this district for a coarse but not heavy paper, like that used for wrapping in the United States. In many of the houses of the poor and the villagers oiled paper is used as a substitute for window glass. For 100 sheets 12 by 18 inches the local price is 2s 1d up. With the progress of education and business requiring notebook, account-books, note paper, letter paper, wrapping paper, envelopes of all sizes and weights, there will doubtless be a large demand for all kinds of paper manufactures and materials. The imports of paper to Canada amounted in value to $6,260,000 in 1912, as compared with $5,490,900, in 1911. The increase was principally in packing paper and paper hangings.

PRICE BROS.

The Kenogami Mills' Earnings Now Over Bond Interest.

Mr. H. C. Price, secretary of Price Bros. & Co., in an interview states that the new Kenogami mills are now earning more than the bond interest. "The operation of these new mills is now very satisfactory indeed," Mr. Price said. "During the last few weeks they have been operated practically at full capacity. Orders are coming in well, and we look for not only meeting of bond interest, but also for a substantial surplus on the stock to be earned by the Kenogami mills this year."

Shipshaw Water Power Co.

The Shipshaw Water Power Co., which is being developed by Price Bros. & Co., is located on the Shipshaw River, at Murdoch Falls, about two miles from Kenogami. The present installation of the company consists of two 3,000-h.p. units. It is intended to develop at first about 5,000-h.p., which amount has been contracted for by Price Bros. & Co. at $15 per h.p. This will give gross earnings of $75,000. The entire common stock is owned by Price Bros. & Co., who will, therefore, control the Shipshaw Water Power Co.

AMERICAN PULP & PAPER ASSOCIATION CHARGES.

(Special to Pulp & Paper Magazine.)

New York, N.Y., March 25, 1914.

A meeting of the executive council of the American Paper & Pulp Association, of which Arthur C. Hastings of 50 Church Street is president, has been called for April 2 at Chicago, Ill., to discuss amendments to the by-laws and other important subjects. "The proposed change," said Mr. Hastings to-day, "to create secretaries for the several divisions and probably a general secretary of the association. The office of president will be a nominal one, as I understand it, and most work will be in the hands of the general secretary and the divisional secretaries under the proposed organization."

Reports from some of the larger divisions that have thus far been submitted to the president show that the feeling is very strong for the maintenance of the association and also a willingness to liberally subscribe to the support of the organization.

The wrapping division will hold a meeting in Chicago at the same time and final arrangements for the changes in its organization will voted upon.

LAURENTIDE COMPANY.

Work will be started on the new power development operation of the Laurentide Company at Grand Mere, Que. From 800 to 1,000 men will be given employment and the work will be rushed in the hope that the construction programme being undertaken will be completed before the end of 1914.

ONTARIO GOVERNMENT BUYS TIMBER LIMITS.

The Ontario Government has secured an option upon timber rights in a large section of the limits of the Pembroke Lumber Company in and immediately adjoining the Algonquin National Park.

The limit taken over, and by order-in-Council brought within the park, is chiefly valuable to the province from the fact that it contains a splendid stand of young pine. The fact that this pine will not be large ernment to purchase it at a reasonable figure, the price agreed upon being $185,000, compared with $200,000 enough for cutting for some years enabled the Government to purchase it at a reasonable figure, the price paid to take over the rights of the Munn Lumber Company three years ago.

INTERNATIONAL PAPER.

Net revenue of the International Paper Co. for 1913 was $2,984,110, a decrease of $254,249. The surplus available for dividends was $993,805, a decrease of $203,873. Preferred dividends of 2 p.c., amounting to $448,134 were paid, leaving a surplus for the year of $545,671. Total surplus is $10,941,294.

The balance available for dividends on the preferred stock was equal to 4.43 per cent. as against 5.34 per. in 1912.

BRITISH TRADE NEWS

SPECIAL TO PULP & PAPER MAGAZINE

London, March 14, 1914.

It is announced that the coating machinery for St. Anne's Board Mill Co., Ltd., Bristol—a new mill that has been erected to supply the needs of the Imperial Tobacco Company, Ltd.—will be supplied by Messrs. Grahl and Hoehl, of Dresden, Germany. The color mixing and color straining machines are of the latest type, the coating machinery, including the drying arrangement, combining modern improvements adapted generally for coating cardboards in the reel. The coating-room of this new mill is about 200 feet long by 54 feet wide and 11 feet high. The finishing machinery, such as calender and cutting machines will also be supplied by Messrs. Grahl and Hoehl. Another piece of interesting machinery will also be seen at the forthcoming printing and other trades exposition, to be held in the Agricultural Hall, London, when the Swift patent paper curing machine will be seen work. This invention has been placed on the market by Messrs. H. O. Strong & Sons, Ltd., of Bristol, and it is reported on as being very effective in reducing paper troubles, maturing any ordinary class or condition of stock with speed and economy.

* * * *

A Successful Mill.

At the annual meeting of C. Townsend Hook & Co., Ltd., the president of the company (Captain J. C. Baxter) said that considering the great rise in the price of coals and chemicals, and of the raw materials used in the manufacture of paper, and the extremely low price of paper during last year, the result of the trading for the year 1913 must be considered satisfactory so far as his firm was concerned. Owing to the necessity of carrying larger stocks of wood pulp and other raw materials on account of the constant strikes, a larger amount had been carried forward than last year, and the item "stock-in-trade" and raw materials was much larger, about $43.200. William Dedrick, managing director of the company, said to-day they had an increased capacity for papermaking, their mill being now a four-machine one, and their latest machine was one of the best that could be obtained. After hearing the various reports, Captain Baxter proposed that a dividend of 6 per cent. per annum on the preference shares up to December 31st last be paid; also, that a dividend of 7 per cent. for the year 1913 be declared on the ordinary shares of the company, less income tax, payable on March 4. The report and the balance sheet were adopted and Captain Baxter was re-elected a director of the company.

* * * *

A Useful Society.

The annual meeting of the Stationers and Paper Manufacturers' Provident Society was held the other day, Sir Thos. Vezey Strong presiding. The report submitted dealt with the steady progress of the Society, which is in a very sound financial position. The invested funds amount to £46,761 10s. 7d., made up by a general fund of £40,086 15s. 10d. and a residence fund of £6,674 14s. 9d. The payments for the year 1913 amounted to £878 11s. 1d., which included annuities £625 5s. 11d., residence fund £198 5s. 2d. and funeral expenses £55. Paper men as a rule in England make every effort to enhance the good work of their various societies and the Stationers and Paper Manufacturers' Provident Society is one that always appeal for support and admiration.

* * * *

New Quality Paper.

Messrs. John Dickinson & Co., Ltd., of London, have added to their large range of art papers a new quality which is reported to be of exceptionally thin substance and specially made for illustrated catalogues. An unusually large number of pages can be worked into a catalogue when the paper is used. This firm now stocks the following sizes and weights which may probably help Canadian papermakers: Double crown 20x30 ins., 31 lbs.; quad crown 30x40 ins., 62 lbs.; double royal 25x40 ins., 52 lbs.; double medium 23x36 ins., 43 lbs.; quad medium 36x46 ins., 86 lbs. There are 516 sheets to the ream and the price of the paper is 7 cents per lb.

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British Trade Declines.

The Trade Board returns for February show that the recent statement appearing in the Pulp & Paper Magazine, viz. that British paper mills are not enjoying a brisk period of late, are fully borne out and that a wave of dullness is passing over the industry. The following show the exports from British mills of writing, news print, printings, packings and wrappings, paper hangings, coated papers, card and other boards, envelopes, etc., for February:

	Cwts.	£
Exports, February, 1914..........	256,375	273,758
Exports, February, 1913..........	228,316	310,899
Exports, Jan.-Febry., 1914........	592,769	606,296
Exports, Jan.-Febry., 1913........	611,247	645,743

To Canada 368 cwts. of printing paper was exported in February as against 612 cwts. in Feb., 1913, and for January-February 843 cwts. compared with 1,071 cwts. in 1913. In printing paper there is also a notable reduction in February, the figures being 4,983 cwts. as against 12,253 cwts., and for January-February 11,841 cwts. compared with 25,509 cwts. in 1913. In the imports of all classes of paper, including boards the returns show: February, 1914, 936,753 cwts., valued at £575,417; February, 1913, 1,050,111 cwts., valued at £618,067; January-February, 1914, 1,927,999 cwts., £1,206,460; January-February, 1913, 2,040,389 cwts., valued at £1,229,766. During February no printings or writing were exported to the British market from Newfoundland. Except for paper on reels, the quantity received from the States mills also shows a decline in February, and except for a small quantity in fine writing and printing papers the exports from the British mills to the States markets also show a substantial decline.

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Wood Pulp Slow—Canada's Exports Raised.

The position of wood pulps in the Trade Board returns is not to say satisfactory. The imports from all sources are as follows:

	February.			
	1913.	1913.	1914.	1914.
	Tons.	£	Tons.	£
Chemical	21,503	171,835	14,512	119,872
Mechanical	34,967	81,658	38,459	84,233

January to February.

	Tons.	£	Tons.	£
Chemical	54,765	431,440	50,023	399,185
Mechanical	77,952	183,923	78,459	175,034

In February mechanical was imported at English ports to the extent of 4,308 tons, compared with 384 tons in February, 1913, whilst the figures for January to February are 12,441 tons. It is very gratifying to see these figures against the name of Canada in this particularly dull month of February.

ABITIBI ISSUE.

An issue of $2,500,000 6 per cent. first mortgage serial gold bonds of the Abitibi Power and Paper Company, Limited, of Iroquois Falls, Ont., is being made by Messrs. Peabody, Houghteling and Company, Chicago.

These bonds are to provide funds for the completion of the company's mills and for working capital. They are secured by an absolute first mortgage upon all the property now owned, or that may hereafter be acquired, by the Abitibi Power and Paper Company, including its water power rights on the Abitibi River, timber limits, pulp and paper mills, of an annual capacity of 65,000 tons.

The total authorized capital of the Abitibi Company is $13,000,000, of which $9,500,000 has been issued, leaving $2,500,000 bonds and $1,000,000 preferred stock unissued.

The company controls under lease from the Government of Ontario, the property known as the Abitibi pulpwood limit, consisting of approximately 1,000,000 acres of pulpwood lands situated along the upper and lower Abitibi lakes, and along the Abitibi River and its tributaries in the District of Temiskaming. Under its grant, the company is obliged to pay the Government in advance, each and every year, for the right to cut and remove pulpwood, the sum of $5,000. These payments have already been made for five years in advance. In addition the company is required to pay 40 cents per cord for spruce and 20 cents per cord for other pulp-making woods. The company's lease is in the standard form, running for a period of twenty-one years, and can undoubtedly be renewed from time to time thereafter, in accordance with the invariable practice of the Ontario Government.

The Abitibi pulpwood limit contains 5,000,000 cords of spruce and other paper-making woods, and the Abitibi watershed above Iroquois Falls contains over 15,000,000 cords of pulp-making timber. A complete newspaper plant, with accompanying groundwood and sulphite mills is being constructed at Iroquois Falls, having a capacity of 65,000 tons of new print paper.

HOWARD SMITH PAPER MILLS ENTERTAIN.

Mr. Smith and the directors of the Howard Smith Paper Mills, Ltd., entertained, about two hundred, friends of the company on Friday, March 27, to a trip to their new mills at Beauharnois, Que. The special train left Windsor Station, Montreal, at noon and they went directly to the mill, spending the afternoon looking over the new plant. Mr. H. C. Courtney the General Superintendent, explained the new features of the mill to his guests, who were delighted with the cleanliness and efficiency of his plant. The grades of paper they have been turning out are meeting with the most enthusiastic reception on the market so that they are already planning on installing a second machine.

The new mill is in the old buildings of the Dominion Woolen Co.

H. FULLNER, WARMBRUNN IN SCHLESIEN.

The remarkable development of the firm, H. Fullner, Warmbrunn, is the result of the excellence of its products. On this also depends the confidence which paper, carton, pasteboard, cellulose and woodstuff manufacturers have in Fullner machines, which are used successfully in all the civilized countries of the world. The importance of the Fullner workmanship can best be judged by its continually increasing big pieces of work. In 1913 alone there were begun, finished and also set up in working order, 30 paper machines, 4 longsieve draining machines, 5 roundsieve carton machines, 3 gelatine sizing machines, 14 calenders, 26 cutting machines, 22 "Kollergangs," 67 Hollanders, 70 knot catchers, 25 patent Fullner filters.

In order to supply the increased demand last year the mechanical department was enlarged by modern equipment and the addition of a paper machine-equipping room, which is furnished with 23 motor travelling cranes and very modern tool machines. Provision has been made for the future so that the widest machines can be completely set up in the work room and can be delivered more quickly than formerly.

In all the important exhibitions the firm of H. Fullner has been given the highest praise. The world exhibition for bok trade and graphic 1914, May to October, in Leipzig, will be of increased interest to the assembled business world because in the group of "paper production" every day it gives ample opportunity to all those desirous of seeing a modern, complete Fullner paper machine in running order. This paper machine with 2,700 mm. sievebreadth, has a wire section 20 metres long, as well as an arrangement for raising and lowering the wire section. The end is made of 26 cylinders. The machine, which is already sold to a Central Germany paper mill, serves for the manufacturing of woodfree, medium, copy and rotary press paper and is geared for a speed of a minimum of 10 and maximum 150 metres per minute, combined with the paper machine are two patent Schacdt-Hollanders, a Fullner roller and a patent Fullner filter so that, since printing presses as well can work in connection with it, the whole process of paper from raw material to the printed sheet is shown.

The Fullner machines will without any doubt form a great drawing card for the Leipzig Exhibition and a brilliant and powerful proof of the examplary trial work and great working capacity of the Fullner plant. The period of the sixty years of the firm of H. Fullner, 1914, has a fitting close in this exhibition of the Fullner paper machine.

DEATH OF JOHN NORRIS.

The announcement of the death of John Norris, chairman of the Committee on Paper of the American Newspaper Association, came as a great shock to all members of the newspaper and paper manufacturing world. He died at his home in Brooklyn after several months of ill-health on March 21st and closed without doubt the most important career of any single man in the news print and publishing industries in the United States. He was always most energetic, forceful and enthusiastic about obtaining his points and carrying out his ideas. His acquaintance among paper manufacturers was very broad and he was known throughout the United States and Canada. John Norris was the leader of the campaign for free paper in the United States during the last tariff discussion and as such showed his ablity as an organizer and worker. As Business Manager of the "New York Times," he also demonstrated his ability to carry on big things.

PULP AND PAPER NEWS

The Northumberland Paper and Electric Company, Limited, of Campbellford, Ont, have disposed of their ground wood plant to the Seymour Power and Electric Company, Limited, who will take possession on April 1st and operate it thence forward. Elie Brunelle, who was for a number of years with the Price, Porritt Paper Company, of Rimouski, Que., has been appointed manager. L. A. Burbank has been appointed superintendent, which position he held with the former owners ever since the mill was built about four years ago. The Northumberland Paper and Electric Company intend improving and enlarging their box board mill during the coming summer.

The Canadian Alkali Company have had plans prepared for a five-hundred-thousand-dollar factory at Sandwich, Ont., and the town has granted the usual exemption to new industries. The company will employ between three and four hundred hands at the start and the pay roll will amount to $150,000 annually. Caustic soda and other chemicals will be manufactured.

In the Ontario Legislature, recently, Z. Mageau, M. P. P., charged that Sturgeon Falls was being robbed of its natural water powers, the trouble arising out of the fact that in 1910 the Cobalt Hydraulic Company were given the right to divert the waters of Lake Temagami into the Montreal river to increase the water power there. The diversion of the natural current, according to Mr. Mageau, has robbed Sturgeon Falls of sufficient water power and is decreasing the usefulness of the various water falls along the route of the Sturgeon river. The member charged the Minister of Lands, Forests and Mines, Hon. W. H. Hearst, with neglect in not seeing that the current was changed back to its natural course. So far as the Spanish River Paper Mills at Sturgeon Falls are concerned, T. H. Watson, Managing Director of the Company, states that they have sufficient water and their industries there have in no way suffered.

It has been virtually decided that the Empire Press Conference will be held in Canada in 1915, instead of this year, and an official invitation has been forwarded by the Canadian committee to the Empire Press Union. It is understood that the Canadian Government will co-operate with the Canadian Press Association to ensure the success of the conference and the adequate entertaining of the delegates. In addition to leading journalists from Great Britain an effort will be made to secure a full representation from Australia, New Zealand and South Africa. It is undertsood that the actual conference will be held in Ottawa and that the distinguished visitors will be taken for a trip across the continent to British Columbia, which province has invited the delegates to be the guests of the provincial authorities.

The Ontario Government is determined on better fire protection in the northern part of the province and a bill has been introduced into the Legislature by Hon. W. H. Hearst, Minister of Lands, Forests and Mines, to enable the department, on application from a municipality in a provisional district to notify the owner to clear away bush bordering on a town. On his neglect or refusal to do so, the department may have the work done and the cost charged to the owner. When the land is situated in an unorganized municipality the work may be done and charged against the land as local taxes. Mr. Hearst says that the bill is necessary because many owners of such land who often live in the older parts of the province refused to go to the expense of clearing the timber off their property and thus their action constituted a great fire risk to the small settlement.

The assets and good will of the George Powley Paper Company, of Toronto, who recently made an assignment to F. C. Clarkson, have been purchased by R. J. Weatherhead, of Toronto. He is widely known to the paper trade in Canada and the United States with which he had been connected in various important capacities for forty years. Several years ago he was manager of the Royal Paper Mills at East Angus, Que. Mr. Weatherhead began his career with the Smith Paper Company, at Lee, Mass., where ground wood pulp was first converted into paper, being brought down from Curtisville, Mass. He was also employed in paper mills in Holyoke, Mass., Wisconsin, the Southern States, Maine, New Hampshire, Quebec and New York. The name of the Powley Paper Company will be changed to the Weatherhead Paper Company. The company have several travelers and handle all kinds of wrapping papers, twine, matches, etc. All the old staff is remaining with the new firm.

John A. Graham, of London, who for several years was a traveller for H. T. Reason & Co., Paper Box makers of that city, was among the victims who met death in the recent fire in the Woodbine Hotel, in Toronto. He was thirty years of age and had resided in London for ten years.

Eric Buckler, of Calgary, who has been spending some time in England, has sailed for home with a member of the great china manufacturing firm of Doultons, to examine the china clay deposits of Southern Alberta and possibly to start a factory.

The big storm of November last did much damage to certain timber limits, both those owned by the Crown and others in the hands of private parties in Northern Ontario, and, under the present act, limit-holders are not allowed to export pulp wood taken from Crown lands unless manufactured into pulp or paper. The saw mills are over supplied as a result of prevailing conditions, and a bill has been introduced in the Ontario Legislature by Hon. W. H. Hearst, Minister of Lands, Forests and Mines, providing that, for a limited period not extending beyond the end of the preesnt year, the exportation of pulp wood cut from Crown lands will be permitted. This proposal suspends for the time being the prohibition of pulp wood exports from Ontario. It is beleived, that in view of the unusual circumstances, the bill will pass without opposition.

The Cornwall Canal has been unwatered for a few weeks while extensive improvements will be made to Lock 20. A concrete retaining wall will be built there and also over the old Lock 19, which will do away with the expense of maintaining gates. During the progress of the work, which will last until the middle of April, the Toronto Paper Manufacturing Company's mill at Cornwall, which draws its power from the canal, will be closed down. In the meantime the plant will be given its usual cleaing and overhauling.

The Workmen's Compensation Bill is now before the Ontario Legislature and is being opposed in many of its features by the Canadian Manufacturers' Association, liability assurance corporations, special groups of employers and even the physicians are complaining of the provisions of the act. In the scale of benefits and awards, which come to the workman or his family for injury or death, which points offered the greatest controversy between the labor interests and the Canadian Manufacturers' Association, when the evidence was being submitted to the Commissioner, Sir William R. Meredith, the Government have adhered strictly to the draft bill. This, in itself, is a compromise between the demands of the two parties. The labor interests asked high benefits and the manufacturing interests insisted upon a much lower rate of liability, and the Commissioner struck a midway figure between the two scales. The amount of indemnity is fifty-five per cent. of the wages of the workman for partial disability up to $2,000, and $20 per month for the widow in the case of death of the husband with five dollars additional for each child up to three children. There is no option given for going outside the groups and considerable detail is involved in this branch of the bill. There is a mass of provision for the working out of the act.

The Associated Ad. Clubs of America, who will hold their annual convention in Toronto from June 21 to 25, will, it is expected, attract between six and seven thousand men representing American capital of $1,600,000,000 and an immense amount of British capital as well. The sum of forty thousand dollars is being raised by the Toronto Ad. Club for the purpose of entertainment and showing the visitors the advantages of the city. William Jennings Bryan, Secretary of State for the United States, will be the guest of the Associated Advertising Clubs and will address a mass meeting in Massey Hall on the afternoon of June 21.

The annual convention of the Canadian Press Association will be held this year at thee Royal Muskoka Hotel, Muskoka Lakes District, on June 26 and 27. This will be the first meeting since the merging of all the other press Association of Canada in the C. .P. A. There will be a radical departure this year in connection with the programme as there will be few set addresses, but the Executive, Advertising and other committees will submit a number of definite issues for the consideration of the convention.

The Timiskaming and Northern Ontario Railway Commission have issued a special report applicable and covering what is known as the pulp woods in Northern Ontario. The report shows that the T. and N. O. Railway is carrying pulp woods at a rate very much lower than any other line in Canada. As, it was felt, that as a colonization railway, the Commission should adopt the lowest possible rates. Chairman Englehart gives some advice on the nature of the settlers desired who can made a success of settlement in Northern Ontario—"those who are willing to work and will bring their hands with their shoulders into the lands of the north." He refers to the pulp wood as the "asset or saving bank of the settler" and contends that the settler willing to work will be virtuallly assured of a clearing with no further cost than the labor expended. Pulp wood and logs removed will cover the cost of the clearing. Mr. Englehart places the average cut at ten cords of pulp wood to the acre and says that prices alongside of the railway for pulpwood vary from $4 to $5.50 per cord. Any person of age and willing to work can secure a 160-acre lot at fifty cents an acre, payable in instalments.

The Stanworth Paper Company, of Toronto, has been granted a federal charter with a capital stock of $250,000 and is authorized to do a general power distribution and power development business. W. J. Simpson, Stewart W. Hall, R. E. W. Duke, Alfred Wales and H. G. Hammond are the incorporators.

The Canadian Live Stock News, Limited, of Toronto, with a capital of $40,000 has been incorporated and will publish a paper devoted to the interest of live stock owners, buyers and breeders. Reginald C. Smith and Victor Ross are behind the new publication.

Ewald Hinsberg, representing Thomas Josef Heimbach, Duren, Rheinland, Germany, manufacturers of all kinds of papermakers' felts, spent a few days in Montreal and Toronto recently on business. In Toronto he was the guest of J. L. Chambers, Canadian representative of the firm.

Work has been started on the new publishing quarters of the Methodist Book and Publishing House on the block bounded by Queen, John and Richmond streets, Toronto. The present building will be five storeys high and will be erected of brick, concrete and terra cotta and the supports and wall will be strong enough to carry another five storeys when required. The cost of the new home will be $600,000.

G. P. Grant, formerly President of the Spanish River Pulp and Paper Mills Co. and the Toronto Paper Manufacturing Co., and for many years associated with the Dominion Bond Co., has along with A. E. Dean, lately head of the statistical department of the Dominion Bond Company, commenced business under the name of Grant, Dean & Co. They will carry on work as general financial agents in Toronto.

Philip J. Ackerman, of Toronto, while touring the Southern States in the interest of the Internaitional Papermakers of America, died recently. Mr. Ackerman, who was for some years connected with one of their publications which had an office in Toronto, was well known to the trade.

F. N. Burt Co., Limited, of Toronto, manufacturers of paper boxes, sales check books, blank books, shipping tags, etc., have declared their regular quarterly dividend of one and a half per cent. on the common stock and one and three-quarter per cent on the preferred. The profits for the past year were $217,302, or an increase of $27,872. The annual meeting of the company will be held in Toronto on March 30. A comparative financial statement for the past two years is as follows:

	1912.	1913.
Mortgages pay ....$	33,000	$ 31,000
Bills pay	273,904	221,000
Realty and plant reserve....	75,000	100,000
Profit balance	137,874	145,635
Real estate	2,285,626	2,423,596
Stock	353,585	387,552
Bills receivable	264,802	367,786
Cash	86,744	90,533

After the payment of the dividends and allowing twenty-five thousand dollars for plant depreciation a balance of $7,761 remains.

Edgar Russell Smith, one of the veteran journalists and publishers of the Province of Quebec, who directed the News of St. John's for over half a century, passed away recently. He was the father of C. Howard Smith, President of the Howard Smith Paper Mills, of Montreal.

Fire broke out recently in the engine room of the planing mill of the Laidlaw Lumber Company, corner of Eastern avenue and St. Lawrence street, Toronto, right in the center of a large yard containing thousands of feet of lumber. The flames were confined to the planing mill. The loss on the mill and machinery was $30,000 and on the lumber stored in the building about $20,000.

Thorold, which has come to the front in recent years in a pulp and paper sense, still goes on acquiring industries and, although no more paper concerns have been landed, another company who will erect an abrasive works, have decided to locate there. They will employ one hundred and fifty skilled hands. A by-law will be voted upon by the ratepayers of Thorold Township on April 2nd, to grant a site and exemption to the company. The location is near the Welland Canal, just outside the town limits.

Under an act recently passed by the Ontario Legislature, the townships of Stratton, Bronson, Guthrie, Barron and Edgar and all lands in the townships of Fitzgerald, White and Niven, not included in Algonquin Park, are to be added and the statute applied to such lands for the protection of fish and fur-bearing animals In all the townships the lands unsuited for settlement are withdrawn for the purpose above mentioned.

The annual report of the Provincial Hydro-Electric Power system has been presented to the Ontario Government. It shows that 357 miles of lines are completed and that 198 miles are under construction. The total capital invested is $5,915,724, while the province has advanced to the $6,022,646. Of this amount $5,190,858 has been expended on the Niagara system. The mileage of the different systems is made up as follows: Niagara 378, St. Lawrence 45, Simcoe 67, Wasdell's Falls 65. Forty-five towns, cities and villages are considered to be under the direct control of the Hydro as against twenty-eight at the close of 1912. Combined, they brought in a revenue of $2,600,000 and made a total profit of almost $400,000 after all just charges and depreciations had been accounted for. The number of consumers for both light and power is 65,689 and the value of the entire plant, including all additions to the end of last year, is placed at $9,136,483. A detailed statement of the flow of many rivers in Northern Ontario, which have been examined by the Commission as possible future power sites, is given.

A writ has been issued at the instance of the Town Council of Fort Frances against the Ontario and Minnesota Power Company for the amount of taxes levied during the years 1911, 1912 and 1913, which are still unpaid. The company objected to paying on the full assessment levied for school taxes for these years and appealed the case for 1911 to the Ontario Railway and Municipal Board. After two hearings, an appeal to the Court of Appeal was made by the Power Company and the amount of assessment, which had been recommended by the Town Council of last year, was affirmed by the court. As the Council had also recommended that a settlement on the same basis be made for 1912, the Power Company on receipt of the decision of the court offered to pay the taxes on the basis of the court's decision. As the decision was for 1911 only, the present Council objected to a settlement in this way and hence the present action.

The Abitibi Pulp and Paper Co., Iriquois Falls, Ont., will install four paper machines as follows: Two 158 inches wide, one 184 inches wide, and one 202 inches wide.

RIORDON PULP.

Profits of the Riordon Pulp and Paper Company for the year ended December 31, 1913, were $309,679, an increase of $2,845 over 1912. After deducting $48,953 for depreciation reserve and $32,652 for interest on bank loans, there remained net profits of $228,073, an increase of $1,824. After payment of bond interest and preferred stock dividends, a balance of $68,073 was added to profit and loss surplus, making a total of $157,301.

The balance sheet shows total assets of $8,670,852. Current assets amounted to $1,866,314, an increase of $420,000 over 1912. Inventories, etc., make up $1,577,010 of this total. Current liabilities total $1,258,037, an increase of $896,000. Bank loans at December 31, 1913, amounted to $700,020, as compared with $80,000 a year previous. Bills and accounts payable also show a large increase. It is stated in the president's report that $500,000 of bonds will be issued to replenish the depleted working capital.

President C. Riordon, in his annual report to the shareholders, stated that about 84 per cent. of the company's production for 1914 is already sold at satisfactory prices. The outlook for the company's business for the current year was very good.

The shareholders will be asked at a special meeting of the company following the annual gathering on April 1, to approve of changes in the by-laws respecting the borrowing of money.

Although it is stated that no new financing is being considered by the directors, it is pointed out that the by-laws governing the borrowing powers are restricted in scope, and that it has been decided to have them altered.

INTER OCEAN NEWSPAPER CO.

(Special to Pulp & Paper Magazine.)

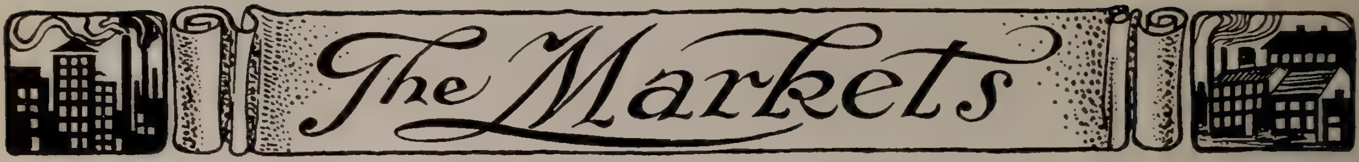
Chicago, Ill., March 25, 1914.

As a result of the complications growing out of its litigation regarding the revaluation of the lease of the ground occupied by the Inter Ocean building and other legal entanglements, application has been made in the United States District Court here for the appointment of a receiver for The Inter Ocean Newspaper Company. Judge Carpenter appointed as receiver Herman H. Kohlsaat, president of The Inter Ocean Newspaper Company. Mr. Kohlsaat, at once took possession of the property of the company.

The bill under which the receiver was appointed was filed as a chancery proceeding instituted by the Lake Superior Paper Company of Sault Ste. Marie, Canada, which held a claim against The Inter Ocean Newspaper Company for print paper, and was assented to by the officers of the newspaper company. The bill stated that because of the controversy wth reference to The Inter Ocean building and the land on which it is situated and because of other conflicting claims the appointment of a receiver was made necessary in order to conserve the property and preserve its business and good will as a going concrn.

The appointment of Mr. Kohlsaat as receiver will make no change in the conduct of The Inter Ocean.

The remodeling of the plant of the Dryden Timber and Power Co. has been completed and the mill is now in operation. The evaporator of the Swenson Evaporator Co. was entirely remodeled and is now up to the increased capacity.



Canadian Markets.

The market situation remains much the same in all lines of paper as it has been for several weeks. News print mills are well employed and price conditions remain unchanged. A recent return shows that the average consumption of news print in the United States during the past year was 4,995 tons per day, and the total increase in 1913 over that of 1912 was 289 tons. Canada is now producing, according to the most conservative estimates, about fifteen hundred tons per day, and a forecast shows that within the next two years, if present plans materialize, there will be an added production of about 800 tons, which will make the total output in the Dominion around twenty-three hundred tons per day. This year there will come on the market 360 tons by reason of the putting in operation of the new mill of the Ontario and Minnesota and Ontario Power Co. at Fort Frances and the two machines of the Powell River Pulp and Paper Co., while the Belgo-Canadian Co. will augment their capacity by fifty tons, and the Brompton Pulp and Paper Co., with their new machine, will add another sixty tons.

The following memoranda will prove of interest to the Canadian trade:—

Consumption of Newspaper in the United States.

	Tons.		Increase over Previous Year.	
Year.	Total.	Per Day.	Total.	Per Day.
1910	1,280,000	4129		
1911	1,372,500	4427	92,500	298
1912	1,459,000	4706	86,500	279
1913	1,548,300	4995	89,300	289
Average			89,430	288

Future Increases of Canadian Production.

Ontario & Minnesota Power Co., Fort Francis, Ont.	150
Abitibi Pulp & Paper Co., Iroquois Falls, Ont. . .	225
Belgo-Canadian P. & P Co., Shawinigan Falls . .	50
Donnacona Pulp & Paper Co., Donnacona, P.Q. . .	50
Brompton Pulp & Paper Co., Brompton, P.Q. . .	60
Laurentide Co., Grande Mere, Que.	100

Imports of Newspaper into United States.

	Total.	Per Day.
January, 1913	12,373	458
January, 1914	23,769	880
Increase.	11,396	422

Book, writing, kraft and wrapping paper mills are fairly well employed, but orders are not as plentiful as the owners would like to see them. The jobbing houses report a good business for March, and some of them have equalled last year's record for the corresponding month. The demand for ground wood pulp remains quiet, while sulphite pulp is active, and prices are firm. In the rag and paper stock market there is a moderate amount of trade, flock stock having gone up a little in price, but ordinary satinets did not show the same feeling. Mixed papers are dull. Most of the orders are for small amounts in all lines.

The following quotations prevail f.o.b. Toronto:—

News (rolls $1.95 to $2.00 at mill in car load lots.
News (sheet) $2.10 to $2.15, at mill in car load lots.
News (sheet) $2.25 to $2.50 at mill in less than car load lots.
Book papers (carload) No. 3, 3.75c to 4.25c.
Book papers (ton lots) No. 3, 4c to 4.50c.
Book paper (Carload) No. 2, 4.25c.
Book papers (ton lots) No. 2, 4.50c to 5.25c.
Book papers (carload) No. 1, 4.75c to 5.25c.
Book papers (ton lots) No. 1, 5.25c to 6.00c.
Writings, 5c to 7½c.
Sulphite Bond, 6½c to 7½c.
Grey Browns, $2.00 to $2.50.
Fibre, $2.75 to $3.50.
Manilla B., $2.40 to $3.50.
Manilla, No. 2, $3.00 to $4.00.
Manilla No. 1, $3.25 to $4.25.
Unglazed Kraft, $3.75 to $4.50.
Glazed Kraft, $4.00 to $5.00.

Pulp.

Ground wood (at mill), $15 to $15.50.
Ground wood, $21 to $23, delivered in United States.
Sulphite (unbleached), $42 to $43, delivered in Canada.
Sulphite (unbleached), $42 to $44, delivered in United States.
Sulphite (bleached), $56 to $57, delivered in Canada.
Sulphite (bleached), $57 to $58, delivered in United States.

Paper Stock.

No. 1 hard shavings, $1.87½ to $1.90.
No. 1 soft white shavings, $1.75.
No. 1 mixed shavings, 50c.
White blanks, 92½c to 95c.
Ordinary ledger stock, $1.15 to $1.20.
Heavy ledger stock, $1.40 to $1.50.
No. 1 book stock, 75c.
No. 2 book stock, 45c to 50c.
No. 1 Manilla envelope cuttings, $1.10 to $1.15.
No. 1 print Manillas, 60c.
Folded news, 45c to 50c.
Over issues, 50c to 52½c.
No. 1 clean mixed paper, 30c.
Old white cotton, $2.50 to $2.75.
Thirds and blues, $1.30 to $1.32½.
No. 1 white shirt cuttings, $5.00 ta $5.25.
Blue overall cuttings, $3.50 to $3.60.
Black overall cuttings, $1.75.
Black linings, $1.75.
New light flannelettes, $4.75.
Ordinary satinets, 75c to 80c.
Flack, 90c.
Tailor rags, 70c to 75c.

* * * *

Quotations f.o.b. Montreal are:—

Book and News Paper.

Roll News, $40 to $43 per ton for large orders; $45 to $50 per ton for small orders.
Ream News, $45 to $47 per ton for large orders; $50 to $60 per ton for small orders.
No. 1 Book, 5¼c to 6c per lb.
No. 2 Book, S.C., $4.50 to $4.75 in large quantities;

$4.75 to $5.50 in small quantities.
No. 3 Book, M.F., $4.00 to $4.25 in large quantities; $4.40 to $4.50 in small quantities.
Writings, 5c to 7½c.
Sulphite Bond, 6½c to 8½c.

Wrappings.

Grey Brown, per 100 lbs., car lots, $2.25 net; 5 tons $2.45; 2 tons, $2.55; 1 ton, $2.65; less, $2.75.
Red Brown, car lots, $2.85; 5 tons, $2.95; 2 tons, $3.05; 1 ton, $3.15; less $3.25.
B. Manilla, car lots, $2.85; 5 tons, $2.95; 2 tons, $3.05; 1 ton, $3.15; less, $3.25.
No. 2 Manilla, car lots, 3.10; 5 tons, $3.20; 2 tons, $3.30; 1 ton, $3.40; less, $3.50.
No. 1 Manilla, car lots, $3.25; 5 tons, $3.45; 2 tons, $3.55; 1 ton, $3.65; less $3.75.
Kraft, $3.75 to $5.00.
Fibre, car lots, $3.25; 5 tons, $3.45; 2 tons, $3.55; 1 ton $3.65; less $3.75.

Most of the manufacturers are quoting 10 per cent. less than the above prices to the jobbing trade on the cheaper lines of wrapping, such as B. Man., No. 2 Man.—grey and red browns.

Pulp.

Sulphite easy bleaching, $43 to $45 per ton.
News quality, $41 to $42 per ton.
Bleached sulphite, $54 to $59 per ton.
Kraft pulp, $3.60 to $4.00.
Ground woods, No. 1, $15 to $16.
Ground wood, No. 2, $22 to $24, delivered United States.

New York Markets.

Office Pulp and Paper Magazine,
209 Broadway, New York.

The closing of one of the fairly large producing domestic sulphite mills has strengthened the market of that product to a considerable extent. There has been no advance in the prices, mut they are now very firm under a rather brisk inquiry. A few new contracts have been closed in foreign pulp, but the general feeling is that paper mills are taking only as much pulp as is needed to fill orders that are on hand. Business in this market is fair, and the feeling is that all paper mills are now running nearly full. There is a growing activity in the spot nature of sulphate and kraft pulp. Importers are closing numerous deals in these grades at fairly good prices. Current quotations in kraft pulp are 1.80c to 2.00c for contract orders, while spot lots are being by mills at 1.90c to 2.05c. No new contracts have been reported closed in the interval. Deliveries are the problem of importers in all grades of foreign pulp at present, as there is a fair inquiry for shipments on the balances of outstanding contracts which are now drawing near their close.

Storage piles of mechanically ground wood pulp have been somewhat cut into during the interval, and paper mills have been asking for shipments on their contracts as well as coming in for spot lots at $22.50 to $25.00 a ton delivered. With the thaw now starting, grinding mills have a good supply of water and plenty of wood is being ground. The feeling here is that the current year will be a good one in mechanical pulp.

There has been a good improvement in the domestic rags market, although the volume of business done has not been up to the anticipations of dealers. The requests for prompt delivery of shipments on old contracts is regarded favorably here, as it tends to prove that paper mills have cut down the surplus supplies that were found on hand at the end of the year. The low grades, especially roofing stock, have been in a little better demand, and prices, though low, are firm. The condition of the foreign rags market is practically without change Importers, however, have abandoned the buyers' market, and are rather holding out for better prices under a slightly improved inquiry. The excess accumulations at mills are fairly well cut down and heavier importations are being made to satisfy the balances of outstanding contracts.

There has been a revival of the activity of the higher grades of old waste papers. Normal shipments are now being made at prevailing quotations in soft and hard white shavings at 2.00c. to 2.10c. a pound respectively. All grades of flat stock are in fair demand with current values ranging f9m.c5rootlryo mp fgdv m a l cmf values ranging from 95c. to $1.5 a hundred pounds for No. 1 and 70c. to 80c. a hundred for No. 2. There is a strong demand for and a brisk movement in old newspapers, especially overissues which are commanding 65c. to 70c. a hundred pounds. A falling off in the demand for old mixed papers is anticipated as one of the largest consumers is now out of the market. Current values ranging from 95c to $1.05 a hundred pounds for of business is being transacted, and in most cases at 40c.

Pulp.

Ground Wood, No. 1, $20 to $24, delivered.,
Ground Wood, No. 2, $17 to $19, delivered.
Uubleached sulphite, dom., 1.90c to 2.20c delivered.
Unbleached sulphite, imptd, 1.75c. to 2c, ex dock, N.Y.
Bleached sulphite, demestic, 2.80c. to 3c delivered.
Bleached sulphite, imptd, 2.60c to 3.05c ex dock, N.Y.
Easy Bleaching, impt. 2.05c to 2.20c ex dock, N.Y.
Unbleached sulphate, imported, 1.75c to 2.10c per pound, ex-dock, New York.
Bleached sulphate, impt., 2.60c to 2.80c, ex dock, N.Y.
Kraft pulp, imported,, 1.80c to 2.00c, ex dock, N.Y.
Soda pulp, domestic, 2.10c to 2.25c, delivered.

Paper.

Since the clearing of snow from the city business in general has shown a slight improvement. The trade at large is very hopeful, but at present shows the condition of the local market to be only fair. The general tone of all lines of business in New York is quiet. The failure and closing of two of the large department stores in this city has had some effect on the advertising pages of the daily newspapers, most of which have had to cut down the size from two to four pages less than they have been running. This has had a considerable effect both in the New York and Boston markets on account of the bankrupt concern's connections in the latter city. The consumption of newsprint in this city as a whole has fallen off about 2½ per cent for the first two months compared with the same period of last year. As a whole, the newsprint business for January and February showed a 5 per cent gain over the same period of last year. Most of this gain was in the Ohio Valley district, which is now in a state of boom. Consumption in that territory exceeds by 15 per cent the consumption of last year. Specialty papers cover and glazed grades, have been very active in demand, and prices are firm. There is an increasing volume of business going on in this line, and the outlook is for a good year. Wrapping papers and side run news are rather plentiful and business is quiet. There is a ready market for hangings and it is reported that several news mills have turned their machines to making this grade. Book papers are in better demand and deliveries are difficult. Writings, bonds and ledgers are in fair demand at prevailing quotations. There is an increase in the inquiry for the medium grades. Tissues have been freely offered at 40c on car lots, and a fairly good number of orders have been closed. There is a little better demand for kraft paper, but prices are still very low and rather weak. Boards are in fair demand at prevailing quotations. Deliveries have been a little slow in the board business, but mills are now fairly well caught up. Toilet papers reflect a little better tone.. Cigarette papers are in brisk inquiry and values are firmly maintained.

News, rolls, transient business, $1.95 to $2.05 f.o.b.
News, rolls, contract renewals, $1.95 to $2.00, f.o.b.
News, sheet, $2.25 to $2.30 f.o.b. mill.
Book papers, car lots, C. & S. C., $4.00 to $4.50 f.o.b.
Book papers, car lots, M.F.S., $3.75 to $3.90, f.o.b.
Writing paper superfine, 13½c to 17c, del. east of Miss. River.
Writing paper, extra fine, 11c, del. east of the Miss. River.
Writing paper, No. 1, fine, 9c., del. east of the Miss. River.
Writing paper, No. 2, fine, 8c, del. east of the Miss. River.
Writing paper, engine sized, 4½c to 8c, del. east of the Miss River.
Bond paper, 5c to 24c, delivered east of Mississippi River.
Ledger paper, 8c to 30c, delivered east of Mississippi River.
Linen paper, 7c to 1c8, delivered east of Mississippi River.
Manila jute, 4¾c to 5¼c, delivered.
Manila, wood, $2.40 to $3.00, delivered.
Kraft, No. 1, $3.50 to $3.75, f.o.b., mill.
Kraft, No. 2, $3.25 to $3.50, f.o.b., mill.
Boxboards, news, $30 to $33 per ton, delivered.
Boxboards, chip, $28 to $31 per ton, delivered.
Boxboards, straw, $28 to $31 per ton, delivered.
Wood pulp board, $42.50 to $45 per ton, delivered.
Tissue, white, cylinder, 40c to 42½c, delivered.
Tissue, fourdrinrie, 47½c to 50c, delivered.
Tissue, jute Manila, 40c to 42½c, delivered.

The British Markets.

(Special to Pulp & Paper Magazine.)

London, March 21, 1914.

A small moderate amount of business of a new character, a small margin of profit and signs of reduced dividends, about fairly and accurately gauges the position and the state that the British paper industry has fallen into recently. Everyone seems to be crying out for more work, and those who have a little to get on with keep grumbling daily. Mills with orders booked up for some time prior to the close of 1913, are in the happiest position to-day; but new business, it is said, that the mills require to push things on in the wood pulp trade, and the chemical manufactories. There is a fair amount of orders passing in newsprint and fine writings, while packing and wrapping papers are in moderate demand. Other classes of papers are dull as regards getting orders for them.

The general opinion prevails here that by the end of March we may see a sudden improvement. Printing shops and publishing houses are working on short-time and as soon as they become a little more brisk, and the present stringency in money removed, we may anticipate a turn for the best. There is a dull feeling over all the continental and English markets, and no doubt the sudden change from last year's trade and the quietness of the political world, has caused these centres to become moribund.

* * * *

The market for sulphite and sulphate is remarkably quiet. The quietness, at the time of writing, is followed by an unusual amount of quietness on the part of the British importers, who are not disposed to talk of business matters so readily, as if things were humming a little better. That "peaceful" state we are in shows our position in the wood pulp world, and shows what way the wind is blowing. Beyond this one cannot go, and so many stories arrive daily from Scandinavia as to what America is doing, and not doing, it forces one to the conclusion that the States must be keeping the Continent and Scandinavia pretty busy with enquiries as certainly the shipments to American ports are very light. Of course, buyers on this side and on the Continent covered themselves pretty well for next year, when quotations were easier for sulphite. That action, no doubt is helping to-day's dullness. Good qualities of sulphate have also been purchased in 1913 for years ahead. But sulphite and sulphate prices are now very firm, and it is reported that Scandinavian stocks are not so very large. Since last report the changes in prices are practically infinitesimal.

* * * *

The tendency in pulp contracts on the part of all Britishers is to have a long contract and this has already been reported to Canadians, who should keep a strict eye out for a share of what is going—agents can help. Therefore, mechanical contracts are large to-day, and the demand for prompt is about the usual average. Buyers are always on the alert for a reduced quotation, but generally speaking, sellers are very firm. Pine 50 per cent moist, is quoted at about $9.70 to $10.70 c.i.f. London, and English ports for unwrapped prompt, whilst forward goes 60 cents to $1.50 extra; dry for prompt is $20.20 to $21.50, and forward $1.00 extra. Dullness prevails now in the market and the same reports reach London in regard to Scandinavia.

Esparto continues strong, and prices are remaining on the same high level. These high prices are being paid for all moderately early shipments, and the margin of profit on Esparto papers is consequently very limited.

* * * *

Rags are in fair demand, and prices are inclined to be easier for most grades. China Clay continues enjoying the busy demand at moderately high prices, whilst contracts for other fillings like mineral white and gypsum, barytes, etc., are all closed for this year, and prompt orders are accepted at high prices. Sizing is inclined to be easier in quotations, while Rosin is going through a dull and cheap period.

SWEDISH MARKETS.

The pulp market at the present moment may be characterized thus

Mechanical Wood Pulp inactive and depressed, Sulphite Cellulose quiet, Sulphate Cellulose, first class brands of Easy Bleaching quality in strong demand with an advancing tendency, other qualities quiet.

In general the pulp markets are adversely affected by the continuation of the depression in the paper trade which does not yet show any signs of passing away.

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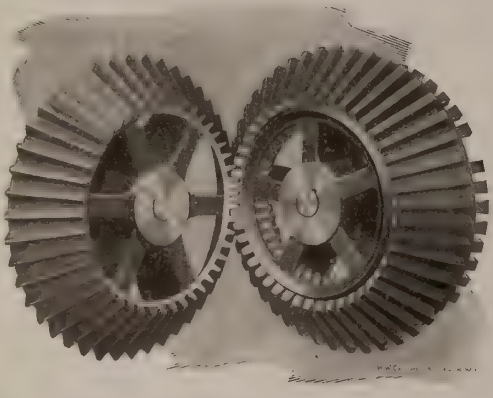

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ONTARIO WILL SUSPEND RESTRICTIONS ON PULP WOOD FOR ONE YEAR.

The Province of Ontario is to allow the exportation of pulp wood cut from Crown lands. The decision of the Government to take this step is due to representations made by the limit holders, who suffered great losses in the storms of last November, when millions of feet of spruce timber was uprooted. Most of this timber is fit only for pulp wood. The Ontario paper and pulp mills are already overstocked with pulp wood, and the only market for it is the United States paper and pulp mills of New York and Pennsylvania. The bill suspends the prohibition of export for one year.

The Imperial Forestry Bureau of Japan has recently been encouraging the growth of camphor trees in order to bring the production of raw material up to the demand for it. Under the direction of the Forestry Bureau each prefectural government in Kyushu has been cultivating model camphor forests, and private individuals have greatly increased the number of trees on their estates. The number of camphor trees in Kyushu is over 500,000, while the area devoted to their cultivation is more than 60,000 acres. Up to the present time all refined camphor has been made at the sacrfice of the tree, but recent experiments, using only the leaves and twigs, have been remarkably successful. As a result the trees will no longer be felled, and as they grow larger the value of camphor forests will increase year by year.

WOOD STEAMING.

Dr. Heuser reported to the Verein der Zellstoff und Papier-Chemiker, at the Berlin meeting last December, the results of his attempts to utilise the waste lyes resulting from this process.. The wood was steamed for eight hours under a pressure of four atmospheres, and a sample was tested every hour. The substances estimated in each batch of lye were organic acids, sugars, rosins, inorganic salts, incrusting bodies, tannins, and furfurol. The rosins, inorganic salts, incrusting bodies (sclerenchyma), and tannins leave the wood without chemical change, but the sugars, furfurol, and acetic and formic acids, owe their production to the action of the steam. The brown colour caused by steaming is to be regarded as an incipient charring.

The production of organic acids is at its maximum after four to six hours' steaming. 100 kg. of wood yielded 213 grammes of acetic and 32 grammes of formic acid, on the average. Fir gave the most formic acid. The greatest yield of dextrose was also with fir, and the maximum yield was reached in from two to five hours with pine, and from four to six hours with fir. The largest yield obtained was one-half per cent. of the weight of the wood. Rosins were not obtained in quantities which would make their recovery remunerative. The furfurol was also negligible.

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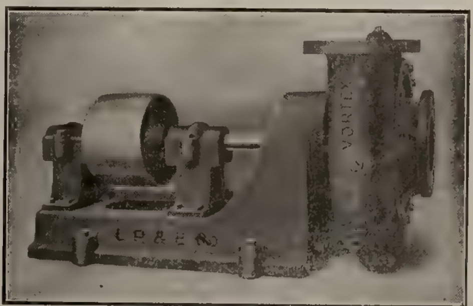

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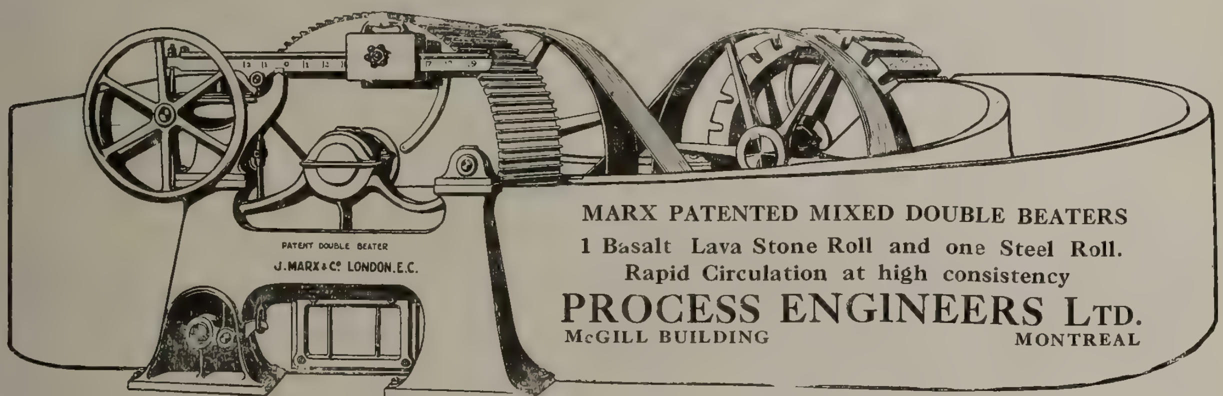

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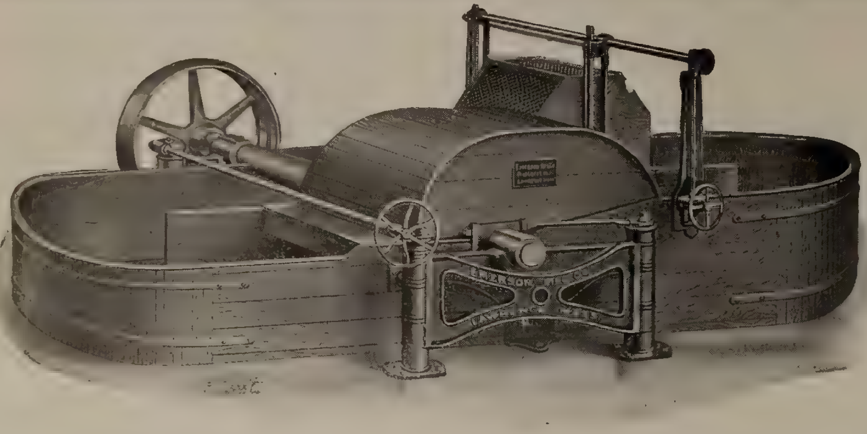

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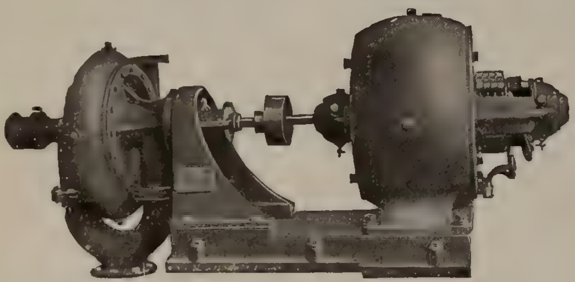

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Air Hoists
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Bags.
Smart-Woods Ltd , Montreal, Que.
Barkers
Boving & Co. of Canada, Limited.
Carthage Machine Co., Carthage, N.Y.
Canadian Barker Co., Ltd., Sault Ste. Marie, Can.
Green Bay Barker Co., Green Bay, Wis.
Hamilton, Wm., Co., Peterboro, Can.
Jenckes Machine Co., Sherbrooke, Que.
Waterous Engine Works Co. Ltd., Brantford, Can.
Valley Iron Works, Appleton, Wis.
Voith, J. M. .Co., Inc., New York, N.Y.
Beaters
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Mach. Co., Lawrence, Mass.
Emerson Mfg. Co., Lawrence, Mass.
Jones, E. D. & Sons Co., Pittsfield, Mass.
Marx & Co., J., London, England.
Process Engineers, Ltd., Montreal, Canada.
Voith, J. M. Co., Inc., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford, Can.
Tippet Arthur P. & Co., Montreal, Can.
Belting
Can. Fairbanks-Morse Co., Ltd., Montreal, Canada
Capital Wire Cloth and Manufacturing Co. Ltd., Ottawa, Ont.
Dominion Belting Co., Hamilton, Can.
Federal Engineering Co., Ltd., Montreal, Que.
Federal Engineering Co., Toronto, Ont.
Manhattan Rubber Mfg. Co., Passaic, N.J.
Reddaway, F. & Co., Montreal, Can.
Bleaching Powders
Brunner, Mond & Co., Montreal, Can.
Hooker Electrochemical Co., Wall St., New York, N.Y.
Klipstein, A. & Co., Ltd., Montreal, Can.
Winn & Holland, Montreal, Can.
Bleaching Machinery
Boving & Co., of Canada, Limited, Toronto, Ont.
Blowers
Sherbrooke Mach. Co., Sherbrooke, Que.
Boilers
Canadian Allis-Chalmers, Ltd., Toronto
Jenckes Machine Co., Sherbrooke, Que.
MacDougall, J., Caledonian Iron Works, Montreal, Can.
Waterous Engine Works Co. Ltd., Brantford, Can
Brass Wire Cloth, Fourdrinier Wires
Capital Wire Cloth and Mfg., Co., Ltd., Ottawa, Ont.
Christie, Geo., Ltd., Glasgow, Scotland.
Johnson, C. H. & Sons, St. Henry, Montreal, Can.
Taylor, James, St. Francois Xavier Street, Montreal, Can.
Tippet, A. P. & Co., Montreal, Can.
United Wire Works, Edinburgh, Scotland.
Westbye, P. P., Peterboro, Can.
Calender Rolls
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Machine Co., Lawrence, Mass.
Farrell Foundry & Mach. Co., Ansonia, Conn.
Camel Hair Belting
Reddaway, F. & Co., Montreal, Can.
Carriers
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Case Slings
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Causticising Systems
Boving & Co., of Canada, Limited, Toronto, Ont.
Chemicals, Colors, Etc.
Brunner, Mond & Co., Montreal, Can.
Gewerkschaft Sachtleben, Homberg, Niederrheim, Germany.
Klipstein, A. & Co., Montreal, Can.
Hooker Electrochemical Co., New York, N.Y.
Paper Makers' Chemical Co., Easton, Pa.
Tippet A. P. & Co., Montreal, Can. .
Wilson-Paterson Co., Board of Trade Bldg., Montreal, Can.
Winn & Holland, Montreal, Can.
Chain Crane
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Chain Blocks
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Chain Clutches
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Chain Slings
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
China Clay
China Clay Co., Manchester, England.
Klipstein, A. & Co., St. Peter Street, Montreal, Can.
Paper Makers' Chemical Co , Easton, Pa.
Wilson-Paterson Co., Board of Trade Bldg., Montreal, Can.
Chippers
Boving & Co., of Canada, Limited, Toronto. Ont.
Carthage Machine Co., Carthage, N.Y.
Valley Iron Works, Appleton, Wis.
Chip Screens
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Cranes
Boving & Co. of Canada, Limited, Toronto, Ont.
Hamilton, Wm. Co., Ltd., Peterboro, Can.
Northern Crane Works, Ltd., Walkerville, Ont.
Smart-Turner Mach. Co., Hamilton, Ont.
Coal Handling Machinery
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Cranes—Gantry
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Cranes—Hand Power
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Cranes—Overhead Travelling
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Cranes—Post Jil
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Cranes—Wall
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Conveying Machinery
Caldwell, H. W. & Son Co., Chicago, Ill.
Jeffrey Mfg Co., Montreal, Can.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Couch Rolls
Bertrams Ltd., Edinburgh, Scotland.
Chambers Ltd., 152 Bay Street, Toronto.
Sherbrooke Mach Co Ltd., Sherbrooke, Q
Cylinders
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co. of Canada, Limited, Toronto, Ont
Chambers Ltd., 152 Bay Street, Toronto.
Sherbrooke Machinery Co., Sherbrooke, Que.
Cutters
Bertrams Ltd., Edidburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Machine Co., Lawrence, Mass.
Cylinder Covers
Boving & Co., of Canada, Limited, Toronto, Ont.
Johnson, C. H. & Sons, Ltd., St. Henry, Montreal, Que.
Kufferath, Andreas, Mariaweiler, Germany.
Cylinder Moulds
Bertrams Ltd., Edinburgh, Scotland.
Chambers Ltd., 152, Bay Street, Toronto.
Sherbrooke Machinery Co., Sherbrooke, Que,
Cylinder Rolls
Capital Wire Cloth and Manufacturing Co. Ltd., Ottawa, Ont.
Dandy Rolls
Capital Wire Cloth and Manufacturing Co. Ltd., Ottawa, Ont
Chambers Ltd., 152 Bay Street, Toronto.
Johnson & Sons, C. H., St. Henry, Montreal, Can.
Marshall, T. J. & Co., Ltd., London, Eng.
Digester Lining
Boving & Co., of Canada, Limited, Toronto, Ont.
Panzl Digester Lining Co., Muskegon, Mich.
Preston's Digester Lining Co., Radcliffe, Eng.
Stebbins Eng. & Mfg. Co., Watertown, N.Y.
Digesters
Boving & Co., of Canada, Limited, Toronto, Ont.
Digester Gauges
Schaeffer & Budenberg, Brooklyn, N.Y.
Drainer Bottoms
Snell, Samuel, Co., Holyoke, Mass
Dryers
Bertram Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Electric Cranes
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Elevating and Conveying Machinery
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Evaporators
Boving & Co., of Canada, Limited, Toronto, Ont.
Process Engineers, Ltd., Montreal, Canada.
Scott, Ernest & Co., Fall River, Mass.
Exhausters
The Sherbrooke Machinery Co , Sherbrooke, Que.
Experimental Machinery
Chambers Ltd., 152 Bay Street, Toronto.
Marshall, T. J. & Co., Ltd., London, Eng.
Process Enginners Ltd., Montreal, Can.
Exporters
Parsons Trading Co., New Tork, N.Y.
Felts
Ayers, Ltd., Lachute Mills, Que.
Bates & Innes, Ltd., Carleton Place, Ont.
Bredt, F. & Co., New York, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Dallyn, Jardine & Co., Toronto, Can.
Heimbach, Thos. Jos., Ltd., Duren, Germany.
Huyck, F. C., Albany, N.Y.
Johnson, C. H. & Sons, St. Henry, Montreal, Can.
Penmans, Ltd., St. Hyacinthe, Can.
Porritt, Joseph & Sons, -Manchester, Eng.
Spencer, J. H. & Sons, Bury, England. .
Tippett Arthur P. & Co., Montreal, Can.
Filters
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Norwood Engineering Co. of Canada, Ltd., Cowansville, P.Q
Fourdriniers Wires
(See Brass Wire Cloth.)
Friction Hoists
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Gauges
Schaeffer & Budenberg,Brooklyn, N.Y.
Generators and Transformers
Chambers Ltd., 152 Bay Street, Toronto.
Siemens Co., of Canada, Ltd., Montreal, Can.
Gravity Lowering Blocks
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Grinders
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage. N.Y.
Glens Falls Mach. Works, Glens Falls, N.Y.
Hamilton, Wm., Co., Peterboro, Can.
Jenckes Machine Co., Sherbrooke, Que.
Voith, J. M. Co., Inc., New York, N.Y.
Voith, J. M., Wurtemberg, Germany.
Waterous Engine Works Co. Ltd., Bran

MILL SUPPLIES---Continued

Heating
Sheldons, Ltd., Galt, Ont.

Hand Hoists
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Hoists.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Northern Crane Works Limited, Walkerville, Ont.

Hoists—Chain Electric and Pneumatic
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Jordan Engines
Boving & Co., of Canada, Limited, Toronto, Ont
Jones, E. D. & Co., Pittsfield, Mass.
Process Engineers, Ltd., Montreal, Canada.

Knives
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Crookes, Roberts & Co., Sheffield, Eng.
Hay, Peter, Knife Co., Galt, Can.
Tippet, A. P. & Co., Montreal, Can.

Kollergangs
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont
Chambers Ltd., 152 Bay Street, Toronto.

Laying Machines
Chambers, Ltd., Toronto.
Collis & Sons, J, London, Eng.

Motor
Chambers Ltd., 152 Bay Street, Toronto.
Siemens Co. of Canada, Ltd., Montreal, Can.

Packings
Canadian Consolidated Rubber Co., Montreal, Can.

Presses
Boving & Co., of Canada, Limited, Toronto, Ont.
Can. Boomer & Boschert Press Co., Montreal, Can.
Chambers Ltd., 152 Bay Street, Toronto.

Paper Stock, Etc.
Hough, R., London, England.
Pullan, E., 490 Adelaide Street, W., Toronto, Can.
Walker, J. R., & Co., 35 Common Street, Montreal, Can.

Paper and Pulp Machinery
Beloit Iron Works, Beloit, Wis.
Bentley & Jackson, Bury, England.
Bertram, James & Son, Ltd., Edinburgh, Scotland.
Bertram's, Ltd., Edinburgh, Scotland.
Black-Clawson Co., Hamilton, Ohio.
Canadian Boomer & Boschert Press Co., Ltd., Montreal.
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Chambers Ltd., 152 Bay Street, Toronto, Can.
Dillon Machine Co., Lawrence, Mass.
Emerson Mfg. Co., Lawrence, Mass.
Farrell Foundry & Mach. Co., Ansonia, Conn.
Fullner, H., Warmbrunn, Germany.
Glens Falls Machine Works, Glens Falls, N.Y.
Green Bay Barker Co., Green Bay, Wis.
Hamilton, Wm., Co., Peterboro, Can.
Harmon Machine Co., Watertown, N.Y.
Jenckes Machine Co., Sherbrooke, Que.
Jones, E. D. & Sons Co., Pittsfield, Mass.
Johnson, C. H. & Sons, Ltd., Montreal, Can.
Marx, I. & Co. London, E.C., England.
Moore & White Co., Philadelphia, Pa.
Process Engineers, Ltd., Montreal, Canada.
Rice, Barton & Fales .Worcester, Mass.
Sandy Hill Iron & Brass Works, Hudson Falls, N.Y
Scott, Ernest & Co., Fall River, Mass.
Sheldons, Ltd., Galt, Can.
Sherbrooke Mach. Co., Ltd., Sherbrooke, Can.
Smith, S. Morgan, Co., York, Pa.
Stebbins Eng. & Mfg. Co., Watertown, N.Y.
Ticonderoga Machine Works, Ticonderoga, N.Y.
Valley Iron Works, Appleton, Wis.
Voith, J. M., New York, N.Y.
Voith, J. M., Wurtemberg, Germany.
Walmsley, Chas. & Co., Bury, Eng.
Waterous Engine Works Co., Ltd., Brantford, Can.
Westbye, P. P., Peterboro, Can.

Paper Machine Tachomoters
Boving & Co., of Canada, Limited, Toronto, Ont.
Schaeffer & Budenberg, Brooklyn, N.Y.

Paper Tester
Chambers Ltd., 152 Bay Street, Toronto.
Marshall, T. J. & Co., Stoke Newington, London, England.

Pneumatic Thickeners
Sherbrooke Mach. Co., Ltd, Sherbrooke, Que.

Pneumatic Chain Blocks
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Press Rolls
Bertrams Ltd., Edinburgh, Scotland.
Chambers Ltd., 152 Bay Street, Toronto.
Sherbroke Mach. Co Ltd, Sherbroke, Que.

Press Wire Cloth.
Chambers Ltd., 152 Bay Street, Toronto.
Kufferath, Andreas, Mariaweiler, Germany.

Pulp Stones
Stancliffe Estates Co., Ltd., Darley Dale, England.

Pumps
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Machine Co., Lawrence, Mass.
Glen Falls Machine Works, Glens Falls, N.Y.
Hamilton, Wm., Co., Peterboro, Can.
Lawrence Machine Co., Lawrence, Mass.
Lawrence Pump & Engine Co., Lawrence. Mass.
Smart-Turner Machine Co., Hamilton, Can.
Sherbrooke Mach. Co., Ltd, Sherbrooke, Que.
Voith, J. M., New York, N.Y.

Rags
Walker, J. R. & Co., Montreal, Can.

Recording Gauges
Schaeffer & Budenberg, Brooklyn, N.Y.

Recording Thermometers
Schaeffer & Budenberg, Brooklyn, N.Y

Refiners
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Marx, J. & Co., London, E.C., England.
Process Engineers, Ltd., Montreal, Canada.
Rice, Barton & Falls Mach. & Iron Co., Worcester, Mass.
Voith, J. M., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford, Can.

Rope Blocks
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Rosin Size
Fox, Stockell & Co., London, Eng.
Paper Makers Chemical Co., Easton, Pa.
Process Engineers, Ltd., Montreal, Canada.
Vera Chemical Co., North Milwaukee, Wis.
Wilson-Paterson Co., Board of Trade Bldg., Montreal, Can.

Rosin Size Boilers and Dissolvers
Boving & Co., of Canada, Limited, Toronto, Ont.

Rotary Sulphur Furnaces
Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Pulp Mill Machinery Co., Montreal, Can.
Stebbins Engineering and Manufacturing Co., Watertown, N Y

Runways—Hand operated
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Save-Alls
Boving & Co., of Canada, Limited, Toronto, Ont.
Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
Waterous Engine Works Co., Ltd., Brantford, Can.

Self Landing, Self Delivery Hoists
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Screen Plates
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.

Screens
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street. Toronto.
Glens Falls Mach. Wks., Glens Falls, N Y
Harmon Machine Co., Watertown, N.Y
Jenckes Machine Co., Sherbrooke, Que.
Johnson, Chas., St. Henry, Que.
Marx & Co., J., London, England.
Process Engineers, Ltd., Montreal, Canada.
Sherbrooke Mach Co. Ltd. Sherbrooke, Que
Tippet Arthur P. & Co., Montreal, Cau.
Voith, J. M., New York, N.Y.
Voith, J. M., Wurtemberg, Germany.
Waterous Engine Works Co. Ltd., Brantford, Can.
Westbye, P. P., Peterboro, Can.

Shear Legs
Morris, Herbert, Hoist & Crane Co., Toronto, Ont.

Slings
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Slitters and Re-Winders
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Cameron Machine Co., Brooklyn, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Moore & White Co., Philadelphia, Pa.
Ticonderoga Machine Works, Ticonderoga, N.Y.

Smelting Furnaces
Boving & Co., of Canada, Limited, Toronto, Ont.

Straw Cutters'
Bertrams Ltd., Edinburgh, Scotland
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.

Straw Dusters
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.

Straw Digesters
Boving & Co., of Canada, Limited, Toronto, Ont.

Strawboard Making Machines
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.

Steam Regulator
Pickles, W. F., Buckland, Conn.

Stuff Chests
Boving & Co., of Canada, Limited, Toronto, Ont.

Sulphite Mill Equipment
Boving & Co., of Canada, Limited, Toronto, Ont.
Stebbins Engineeringand Manufacturing Co., Watertown, N.Y

Sulphate Mill Equipment
Boving & Co., of Canada, Limited, Toronto, Ont.

Sulphur
Union Sulphur Co., 17 Battery Place, New York, N.Y.

Sulphur Burners
Boving & Co., of Canada, Limited, Toronto, Ont.
Glens Falls Machine Works, Glens Falls, N.Y.
Stebbins Engineering and Manufacturing Co. Watertown, N.

Tachometers (Hand and Stationary)
Boving & Co., of Canada, Limited,Toronto, Ont.
Schaeffer & Budenberg, Brooklyn, N.Y.

Track Systems
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Tanks
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Boving & Co., of Canada, Limited, Toronto, Ont.
Hamilton, Wm, Co., Peterboro, Can.
Jenckes Machine Co., Sherbrooke, Que.
McDougall, John, Caledonian Iron Works, Montreal, Can

Thermometers
Schaeffer & Budenberg, Brooklyn, N.Y.

Transmission Machinery
Caldwell, H. W. & Son Co., Chicago, Ill.
Canadian Allis-Chalmers, Limited. Toronto
Boving & Co., of Canada, Limited, Toronto
Jones & Glassco, Montreal, Can.

Traveling Cranes
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Trolleys
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

MILL SUPPLIES---Continued

Turbines

Boving & Co., of Canada, Toronto, Ont.
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Smith, S. Morgan Co., York, Pa.
Voith, J. M. Co., Inc. New York, N.Y.
Voith, J. M., Wurtemberg, Germany.

Water Wheels

Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Hamilton, Wm. Co., Ltd., Peterboro, Can.
Smith, S. Morgan Co., York, Pa.
Voith, J. M., New York, N.Y.

Wire Cloth for Paper Machines

Chambers, Ltd., Toronto.
Christie, Geo., Ltd., Glasgow, Scotland,
Johnson, C. H. & Sons, Ltd., St. Henry, Montreal, Que
Kufferath, Andreas, Mariaweiler, Germany.
Tippet, Arthur P. & Co., Montreal, Can.
Taylor, J. A., Montreal, Can.
United Wire Works, Ltd., Edinburgh, Scotland.
Westbye, P. P., Peterboro, Can.

Waste

Hough, R., London, England.

Wet Machines

Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Glens Falls Machine Works, Glens Falls, N.Y.
Hamilton, Wm. Co., Peterboro, Can.
Norwood Engineering Co. of Canada, Ltd., Cowansville, P.Q.
Process Engineers, Ltd., Montreal, Canada.
Sherbrooke Machinery Co., Sherbrooke, Can.
Voith, J. M., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford Ont.

PULP AND PAPER MILL PRODUCTS

This aims to be a complete list of the products of Canadian Pulp and Paper Mills, who are urged to send us lists of brands and watermarks, as well as the headings under which they wish to be indexed. Buyers who cannot meet their requirements from this list, are invited to communicate with the editor, who is in close touch with the mills, and will gladly furnish full information.

PULP MILLS

Ground Wood Pulp

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
Basin Electric Light & Power Co., Ltd., Montmagny, Que.
Beaver Co. Ltd., Thorold, Ont.
Belgo-Canadian Pulp & Paper Co., Shawinigan Falls, Que.
Brompton Pulp & Paper Co., Brompton and E. Angus, Que.
Booth, J. R. Ottawa, Ont.
Bronson Co., Ltd., Ottawa, Ont.
Clyde River Pulp & Paper Co., Ltd., Liverpool, N.S.
Colonial Wood Products Co., Ltd., Thorold, Ont.
Campbell Lumber Co., Weymouth, N.S.
Canada Paper Co., Ltd., Montreal, Que.
Chicoutimi Pulp Co., Chicoutimi, Que.
Compagnie de Pulpe de Dalmas, Dalmas, Que.
Davy, James, Thorold, Ont.
Eddy Co., The E. B., Ltd., Hull, Que.
East Canada Power & Pulp Co., Ltd., Nairn Falls, Que.
Foley-Rieger Pulp & Paper Co., Ltd., Thorold, Ont.
Ford, J. & Co., Port Neuf, Que.
Jacques-Cartier Pulp & Paper Co., Montreal.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
La Cie de Metabetchouan, St. Andre, Que.
La Havre Pulp Co., Ltd., Bridgewater, N.S.
Lake Megantic Pulp Co., Lake Megantic, Que.
Laurentide Co., Ltd., Grand Mere, Que.
MacLaren Co., Ltd., The James, Buckingham, Que.
McLeod Pulp Co., Ltd., Liverpool, N.S.
News Pulp & Paper Co., Ltd., St. Raymond, Que.
Nicolet Falls Pulp & Lumber Co., Nicolet Falls, Que.
North Shore Power, Railway & Navigation Co., Clarke City.
Northumberland Paper & Electric Co., Campbellford, Ont.
Nova Scotia Wood & Pulp Co., Ltd., Mill Village, N.S.
Ontario Paper Company, Thorold, Ont.
Ouiatchouan Falls Paper Co., Ouiatchouan Falls, Que.
Powell River Co., Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que'
Price-Porritt Pulp & Paper Co., Rimouski, Que.
Reed, A. E. & Co., (Nfld.), Ltd., Bishop's Falls, Nfld.
River-du-Loup Pulp Co., Ltd., Fraserville, Que.
Soucy, F. Florentine, Old Lake Road, Que.
Spanish River Pulp and Paper Mills, Ltd., Espanola, Ont., Sturgeon Falls, Ont., Toronto, Ont., and Sault Ste. Marie, Ont.
St. George Pulp and Paper Co., St. George, N.B.
Thorold Pulp Co., Ltd., Thorold, Ont.
Trent River Paper Co., Ltd., Frankford, Ont.
Union Bag & Paper Co., Cape Madeleine, Que.
Trent Valley Paper Mills, Glenmiller, Ont.
Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Q

Kraft

Brompton Pulp & Paper Co., East Angus, Que.
Dryden Timber and Power Co., Dryden, Ont.
New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
Quebec and St. Maurice Industrial Co., La Tuque, Que.
Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que

Soda Fibre

Canada Paper Co., Ltd., Montreal and Toronto.
Dominion Paper Co., Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.

Sulphite Fibre

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
Booth, J. R., Ottawa, Ont.
Dominion Pulp Co., Ltd., Chatham, N.B.
Edward Partington Pulp & Paper Co., Ltd., St. John, N.B.
Eddy Co., The E. B., Ltd., Hull, Que.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Lake Superior Paper Co., Ltd., Sault Ste. Marie, Ont.
Powell River Co., Ltd., Powell River, B.C.
Price Bros. & Co., Ltd , Kenogami, Que.
Riordan Pulp & Paper Co., Ltd., Montreal, Que.
Spanish River Pulp and Paper Mills Ltd., Sturgeon Falls, Ont., and Sault Ste. Marie, Ont.
Swanson Bay Forests, Wood, Pulp & Lumber Mills, Ltd., Swanson, Bay, B.C.
Toronto Paper Mfg. Co., Ltd., Cornwall, Ont.

PAPER MILLS

Bag

Eddy, The E. B. Co., Ltd., Hull, P. Q.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
Ford, J. & Co., Port Neuf.
Wilson, Ltd., J. C., 61 St. Alexander Street, Montreal, Que.
Jonquiere Pulp Co., Jonquiere, Que.

Binders' Board

McArthur, Alex. & Co., Montreal.
Northumberland Paper and Electric Co., Campbellford, Ont.

Blotting

Canada Paper Co., Montreal, Que., "Velvet Blotting."

Board

See Wood Board and Cardboard Specials.

Bond

Canada Paper Co., Ltd., Montreal, Que. "Burmese Bond," "St. Lawrence Bond," "Canada Bond," "Burmese Linen Ledger," "Windsor Mills Special," "Silverstream," "Springvale," "Super Writing," "White Railway," "Railway Manilla."
Howard Smith Paper Mills, Ltd., Montreal & Beauharnois, Que.
Kinleith Paper Co., Ltd., St. Catharines, Ont.
Rolland Paper Co., St. Jerome, Que., Mount Rolland, Que. and Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Book and Litho

Canada Paper Co., Ltd., Montreal, Que. "Art Photo Book," "Tinted Art Book," "Art Chromo," "English Book," "Satin Book," "Satin Litho," "Litho Label," "Super S. C. Book," "Standard S. C. Book," "Windsor Book."
Eddy Co., The E. B. ,Ltd., Hull, Que.
Kinleith Paper Co., Ltd., St. Catharines, Ont.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Box Board

See Wood Board and Cardboard Special .

Dominion Timber Regulations

Licenses to cut timber on Dominion Lands in the Provinces of Manitoba, Saskatchewan, and Alberta, the Northwest Territories, within twenty miles on either side of the main line of the Canadian Pacific Railway in the Province of British Columbia, and in the tract of three and one-half million acres to be located by the Government of the Dominion in the Peace River district in the Province of British Columbia, lying east of the Rocky Mountains and adjoining the Province of Alberta, shall be disposed of by public auction at the office of the Dominion Timber Agent for the district in which the berths are situated.

Before any parcel of timber is offered for sale it shall be surveyed by a duly qualified Dominion Land Surveyor into berths of an area not exceeding twenty-five square miles, and each of such berths shall then be thoroughly cruised by a duly qualified timber cruiser in the employ of the Dominion Government. The Minister shall then fix an upset price at which the berth shall be disposed of, and no berth shall be sold at less than the price so fixed.

Purchases to the amount of one thousand dollars or under shall be paid in cash at the time of sale. Purchases over one thousand dollars and not exceeding five thousand dollars shall be paid, one-half in cash at the time of sale, and a note or notes shall be given for the remaining half of the purchase price, payable in three months, with interest at the rate of five per cent. per annum. Purchases over five thousand dollars and not exceeding ten thousand dollars shall be paid one-third in cash at the time of sale, and notes shall be given for the remaining two-thirds of the purchase price, payable in three and six months, with interest at the rate of five per cent. per annum. Purchases exceeding ten thousand dollars shall be paid one-fourth in cash at the time of sale, and notes shall be given for the remaining three-fourths of the purchase price, payable in three, six and nine months, with interest at the rate of five per cent. per annum. Notes shall be made payable at a bank in the city or town in which the sale is held or at a bank in the city of Ottawa. Cash payments must be made at the time of sale in legal tender or by an accepted cheque on a chartered bank, or by a draft issued by a chartered bank, payable to the order of the Deputy Minister of the Interior. If default is made in any payment required by this section the sale shall be forfeited and void.

The purchaser must also pay the cost or the estimated cost of the survey of the berth before a license is issued.

The licensee shall pay an annual ground rent of five dollars per square mile except for lands situated to the west of Yale, in the Province of British Columbia, in which case the yearly ground rent shall be five cents per acre.

The licensee shall pay the following dues on timber cut on his berth:—

Sawn lumber, 50 cents per thousand feet, board measure.

Railway ties, eight feet long, 1½ cents each.

Railway ties, nine feet long, 1¾ cents each.

Shingle bolts, 25 cents per cord.

And 5 per cent. on the sale of all other products of the berth.

Timber Permits

Yearly permits are granted to settlers, mine operators and others on application to the Dominion Timber Agents, from whom further information can be obtained.

W. W. Cory
Deputy Minister.

Department of the Interior, Ottawa,
December 20th, 1912.

PAPER MILLS---Continued

Bristol

Don Valley Paper Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.
Canada Paper Co., Montreal & Toronto, "King Bristol," "Windsor Bristol," "C. P. S.Tinted Bristol," "Canada Bristol."

Building and Sheathing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que.
British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
Eastern Paper Co., Ltd., St. Basile, Que.
Montreal Paper Co., St. Basil, Que.
Northumberland Paper and Electric Co., Ltd., Montreal.
Riordon Pulp and Paper Co., Ltd., Montreal, Que.
Western Paper Mills, Ltd., Vancouver, B.C.
Jonquiere Pulp Co. Ltd., Jonquiere, Que.
Ford, R. & Son, Port Neuf, Que.
Laurentide Co., Ltd., Grand Mere, Que.
McArthur, Alex. & Co., Montreal, Que.
McLeod Pulp Co., Ltd., Liverpool, N.S.
Walker, J. R. & Co., Montreal, Que.

Cardboard Specials

Hinde & Dauche Paper Co., Ltd., Toronto, Ont.
Jonquiere Pulp Co., Jonquiere, Que.
Macleod Pulp Co., Ltd., Liverpool, N.S.
Canada Paper Co., Windsor Mills, Que. "Victor Printers' Blanks," "Superior Translucent Bristol," " C.P.C. Coated Litho," "Superfine Litho Blanks."
Booth, J. R., Ottawa, Ont.
Eddy, E. B. Co.. Ltd., Hull, Que.
Laurentide Co. Ltd., Canada Life Building, Montreal, Que.

Carpet Lining

Ford, J. & Co., Port Neuf Station, Que.
Montreal Paper Co., St. Basile, Que.
Northumberland Paper & Electric Co., Ltd., Campbellford. Ont,
Wentworth Paper Mills, West Flamboro, Ont.
Western Paper Mills, Ltd., Vancouver, B.C.

Coated

Ritchie & Ramsay, Toronto, Ont.
Georgetown Coating Mills, Ltd., Georgetown, Ont.
National Paper Co., Valleyfield, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.

Corrugated Paper

Lazier Paper Mills, Ltd., Belleville,
Hinde & Dauche Paper Co., Ltd., Toronto, Ont.

Cover

Canada Paper Co., Ltd., Montreal and Toronto, "Tinted Art Cover," "Derby Cover," "Fibrestoc Cover," "Cashmere Cover," "X Cover," "XX Cover."
Eddy Co., The E. B. Ltd., Hull, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Ritchie & Ramsay, Toronto, Ont.

Envelope

Don Valley Paper Co., Ltd., Toronto.
Kinleith Paper Co., Ltd, St. Catherines, Ont.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Felts

Bird, F. W. & Sons, Hamilton, Ont., and Pont Rouge, Que.
Eastern Paper Co., Ltd., St. Basile, Que
McArthur, A. & Co., Montreal, Que.
Ford, J. & Co., Port Neuf, Que
Ford, R. & Son, Port Neuf Station, Que.
Montreal Paper Co., St. Basile, Que.
Northumberland Paper & Electric Co., Ltd., Campbellford.
Western Paper Mills, Ltd., Vancouver, B.C.

Fibre

Canada Paper Co., Ltd., Montreal and Toronto.
Dominion Paper Co., Montreal, Que.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
McArthur, Alex. & Co., Montreal, Que.
Riordon Pulp and Paper Co., Merritton, Ont.
Strathcona Paper Co., Strathcona, Ont.
Wilson, Ltd., J. C., Montreal, Que.

Flour Sacks

Eddy Co., The E. B., Ltd., Hull, Que.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal.

Glazed

Provincial Paper Mills Co., Ltd., Toronto, Ont.

Hanging

Lincoln Paper Mills Co., Ltd., Merritton, Ont.
McArthur, Alex. & Co., Montreal, Que.
Moira Paper Mills, Belleville, Ont.
Riordon Pulp and Paper Co., Ltd., Montreal, Que.
Strathcona Paper Co., Strathcona, Ont.

Kraft

Brompton Pulp & Paper Co. Ltd., East Angus, Que.
Dominion Paper Co. Ltd., Montreal, Que.
Dryden Timber and Power Co. Ltd., Dryden, Ont.
New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que.

Leather Friction Board

Walker, J. R. & Co., Montreal, Que.

News

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
Belgo-Canadian Pulp and Paper Co., Shawinigan Falls, Que.
Booth, J. R., Ottawa, Ont.
Canada Paper Co., Ltd., Montreal and Toronto, "Canada Brand."
Eddy Co., The E. B., Ltd., Hull, Que.
Ford, Joseph & Co., Port Neuf, Que.
Fort Frances Pulp & Paper Co., Ltd., Fort Frances, Ont.
Jonquiere Pulp Co., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Lake Superior Paper Co., Sault Ste. Marie, Ont.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
McArthur, Alex. & Co., Montreal, Que.
Miller Bros. Co., Ltd., Glenmiller, Oht.
News Pulp & Paper Co., Ltd., St. Raymond, Que.
Powell River Co. Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que.
Riordon Pulp and Paper Co., Ltd., Montreal, Que
Spanish River Pulp & Paper Mills, Ltd., Toronto, Ont.
Ontario Paper Co., Thorold, Ont.

Roofing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que.
Ford, Joseph & Co., Port Neuf, Que.
Ford, Rowland and Son, Port Neuf, Que.
Montreal Paper Co., St. Bazile, Que.
Walker, J. R. & Co., 35 Common, Montreal, Que.
Western Paper Mills, Ltd., Vancouver, B.C.

Straw Board

Ford, J. & Co., Port Neuf, Que.
Lazier Paper Mills, Ltd., Belleville.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
McArthur, A. & Co., Montreal, Que.
Moira Paper Mills, Belleville, Ont.
Northumberland Paper & Electric Co., Campbellford, Ont
Trent River Paper Co., Ltd., Frankford, Ont.
Trent Valley Paper Mills, Glenmiller, Ont.

Tag

Don Valley Paper Co., Ltd., Toronto, Ont.
Eddy, The E. B. Co., Ltd., Hull, Que.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
J. R. Booth, Ottawa, Ont.

Tissue and Toilet

Eddy Co., The E. B., Ltd., Hull, Que.
Garden City Paper Mills, Ltd., St. Catharines, Ont.
Interlake Tissue Mills, Ltd., Merritton, Ont.
Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Que

Wall Board

Beaver Co., Ltd., Beaverdale, Que.
Bishoprick Wallboard Co., Ottawa, Ont.

Wood Board

Beaver Co. Ltd., Thorold, Ont.
Booth, J. R. Ottawa.
Brompton Pulps Paper Co. Ltd., East Angus, Que.
Canada Paper Co., Montreal, Que.
Eddy Co., The E. B., Ltd., Hull, Que.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Northumberland Paper & Electric Co., Campbellford, Ont.
McLeod Pulp Co., Liverpool, N.S.
Western Paper Mills, Ltd., Vancouver, B.C.
Wilson, J. C., Ltd., 61 St. Alexander St., Montreal Que

Wrapping

Booth, J. R., Ottawa, Ont.
Canada Paper Co., Ltd., Montreal and Toronto, "Scotch Fibre," "Invictus Fibre," Hercules Manilla," "St. Fancis Manilla," "Wave Crest Drug."
Dominion Paper Co., Montreal, Que.
Don Valley Paper Co., Ltd., Toronto, Ont.
Eddy Co., The E. B., Ltd., Hull, Que.
Ford, J. & Co., Port Neuf, Que.
Ford, Rowland, Port Neuf, Que.
Gore Valley Paper Mills, Dundas, Ont.
Jonquiere Pulp Co., Ltd., Jonquiere, Que
Laurentide Co., Ltd., Grand Mere, Que.
Canada Paper Co., Monreal and Toronto.
See also Kraft.

Writing

Howard Smith Paper Mills Ltd., Beauharnois, Que.
Kinleith Paper Co., St. Catherines, Ont.
Rolland Paper Co., Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Manufacturing Co., Cornwall, Ont.

THE PROVINCE OF ONTARIO

is rich in timber, mineral, agricultural, and other resources.

Ontario has large areas of White Pine and other valuable timbers, her timber products last year representing one-third of the total output of Canada.

Ontario has pulpwood areas practically illimitable, and offers a great field for those desirous of embarking in the pulp and paper-making industry.

Ontario has innumerable waterfalls capable of supplying power for all manufacturing purposes, which are obtainable on reasonable terms, subject to development.

Ontario has large pulp and paper mills in operation at Ottawa, Sturgeon Falls, Spanish River Sault Ste. Marie and Dryden and large plants are under construction at Abitibi on the Temiskaming and Northern Ontario Railway, and Fort Frances on the Rainy River.

Ontario is traversed East and West by three great transcontinental railways, and North and South by three others.

For full particulars as to Ontario's great resources and the advantages offered for large wood-using industries apply to

Hon. W. H. Hearst
Minister of Lands, Forests and Mines
Toronto

Paper Mill Agents and Commission Merchants

Calgary, Alta.
Davis, W. D. & Co., 3rd Street, W., and 7th Avenue.
John Martin Paper Co., Ltd.
Tees & Persse.

Edmonton, Alta.
Tees & Persse.
John Martin Paper Co., Ltd.

Saskatoon, Alta.
Tees & Persse.

Vancouver, B.C.
Brake, Creedon Co., Ltd.
Mitchell Bros., 123 Cordova E.
Smith, Davidson & Wright.

Victoria, B.C.
Mitchell Bros., 8 Bastion.

Moose Jaw, Sask.
Tees & Persse.

Regina, Sask.
Tees & Persse.

Winnipeg, Man.
Barber & Ellis
Clark Bros. & Co., Ltd., 143 Portage.
Ratcliffe Paper Co., Ltd.
Hudson Paper Co.
Kilgour Bros.
Martin, John, Paper Co., Ltd., 319 William.
McAllister & Watts.
McFarlane, Son & Hodgson, Bannatyne and Adelaide.
Tees & Persse.
John Martin Paper Co., Ltd.

St. John, N.B.
Schofield Paper Co., Ltd., 26-30 Prince William.

Moncton, N.B.
Reid, F. P. & Co.

Halifax, N.S.
Eastern Supply & Paper Co., 28 Bedford Row.
Latter, N., 104½ Windsor.
Allen, T. C. & Co.

New Glasgow, N.S.
McGregor, R. & Co.

Kingston, Ont.
Hendry, J. A., 875 Princess.

Hamilton, Ont.
Buntin, Gillies & Co., Ltd., John and Jackson.
Powis, A., 64 King E.

Ottawa, Ont.
Barnard, W. R., 374 Bank St.
Reid, C. De Wolf.

Port Arthur, Ont.
Tees & Persse.

Toronto, Ont.
Barber-Ellis Co., Ltd., 71 Wellington Street, W.
Brown Bros., Ltd., 51 Wellington Street, W.
Buntin, Reid Co., 13 Colborne.
Canada Paper Co., Ltd., 112 Bay Street.
Ratcliffe Paper Co., Ltd.
Fisher, E. W., 215 Victoria.
Gaine, T. & Son, 124 Richmond W.
Gage, W. J. Co., Ltd., 84 Spadina Ave.
Hodge-Sheriff Paper Co., McKinnon Building.
Howell, G. A. Co., 10 Wellington E.
Livingstone, H. E. & Co., 80 George.
McNairn, J. H., 5 Jarvis.
Thorne, A. M. & Co., 45 Colborne Street
Victoria Paper & Twine Co., Ltd., 415 King W
Waters Bros., 33 Front E.
Whyte, Alex., 64 Wellington Street, W.
Wilkinson, E. H., Telephone Building.

Montreal, Que.
Dawson, W. V. & Co., 17 De Bresoles.
Dickinson, John & Co., Ltd., 216 Lemoine.
Little, T. B. & Co., 23 Cote.
Lloyd, Ed., Ltd., Eastern Townships Bank Building
McFarlane, Son & Hodgson, 14 St. Alexander.
Reid, C. DeWolf, Herald Bldg.
Robertson & Parker, St. Paul.
Rolland, J. B. & Son, 14 St. Vincent.
Smith, Howard, Paper Mills, Ltd., 138 McGill.

Quebec, Que.
Andrews, F. H. & Son, 64 St. Paul.
Rolland, J. B. & Son, 36 St. Paul.

Foreign
Salomon & Co., Felix, New York City,
Whitaker Paper Co., Cincinnati, Ohio.
Castle, Gotheil & Overton, New York, N.Y.
Churchill & Sim, Clements Lane, London, E.C., Eng.
Parsons Trading Co., 1 Battery Place, New York.
Pulp and Paper Trading Co., Temple Court Building, New York.
Scandinavian American Trading Co., New York, N.Y.

WANT AND FOR SALE

WANTED COMPETENT BOSS FINISHER, 25 ton mill, book, writing, loft-drying, linen finishing. Apply, with references, to K. Y., Pulp and Paper Magazine, Montreal.

MILLWRIGHTS wanted for new Pulp Mill in Ontario; must be experienced in erection of machinery; state experience and wages required Abitibi Pulp and Paper Co., Ltd., Iroquois Falls, Ont.

POSITION AS MILL ARCHITECT or designer for sulphite pulp or wood pulp paper mills. Also consultations. Brown steamed wood pulp and paper a specialty. Consumption of sulphur in last mill built 8 per cent. Wide experience in Europe, United States and Canada. High testimonials for economical construction. Correspondence solicited. Address C. E. B., Pulp and Paper Magazine, Montreal.

PULP & PAPERMAN—College graduate, wants position. Several years' experience as superintendent and general foreman in pulp mill. Last four years in construction and engineering office. Box 80, Pulp and Paper Magazine, Montreal.

PRACTICAL MILL MANAGER—ten years in present position—has decided to change and invites correspondence (confidential). Any grades up to S. C. Book and writings. Address: Box 81, Pulp and Paper Magazine.

SUPERINTENDENT of experience wants position in mill making news, book, hanging, Manilla or specialties. Good on color and have good mechanical ability. References furnished.—S. W. K., Pulp and Paper Magazine, Montreal.

ELECTRICIAN with twelve years' experience in construction, desires position with Pulp Company. Was in charge of Wayagamack Pulp Co. Box 79, Pulp and Paper Magazine, Montreal.

CHEMIST wants position with reliable company in investigation or control work. Understands pulp and paper manufacture. Five years' experience. Technical and engineering training. Any location. In replying give details as to requirements. Address, Paper Chemist, Pulp and Paper Magazine, Montreal.

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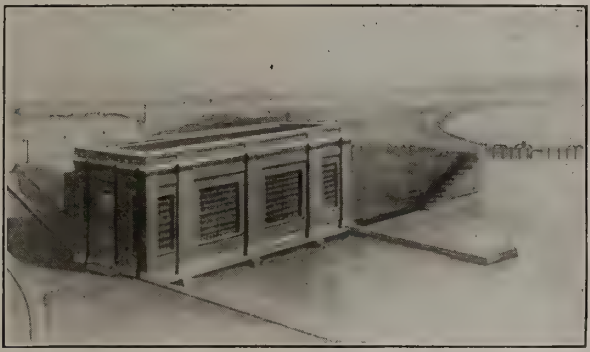
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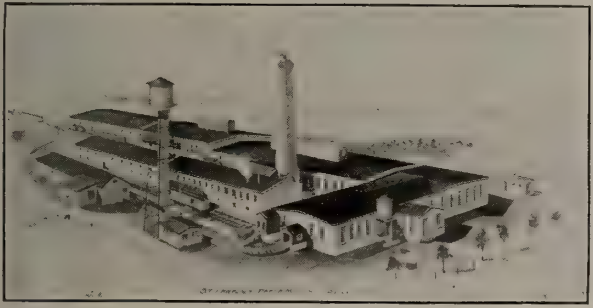
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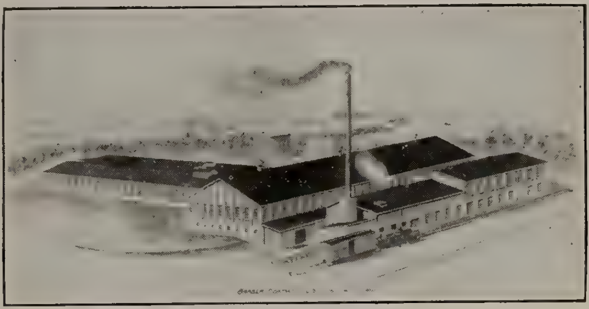
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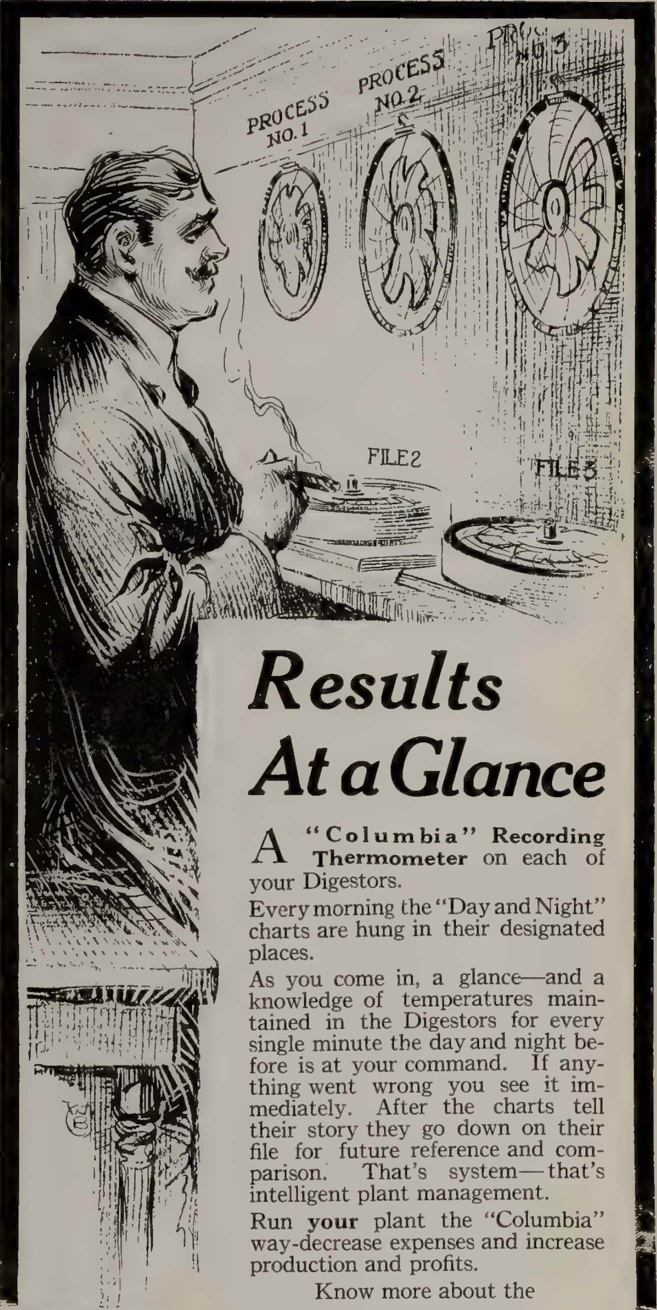

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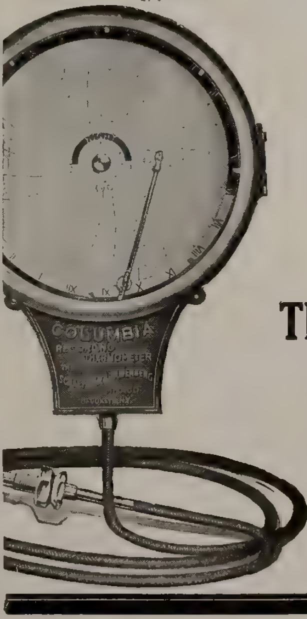

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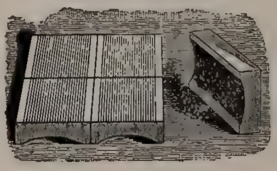

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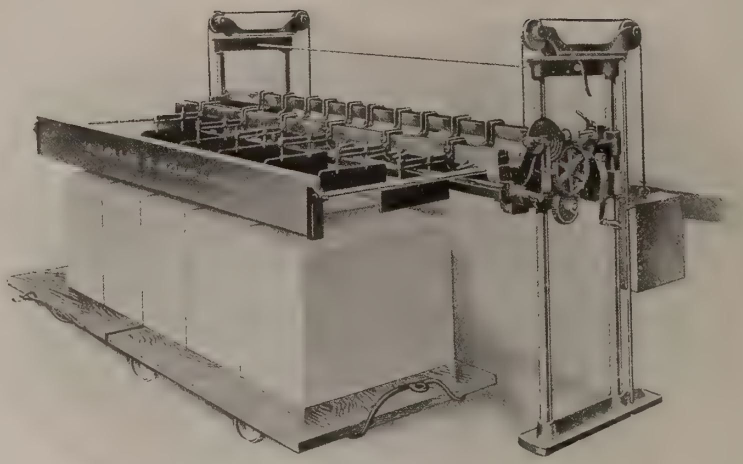

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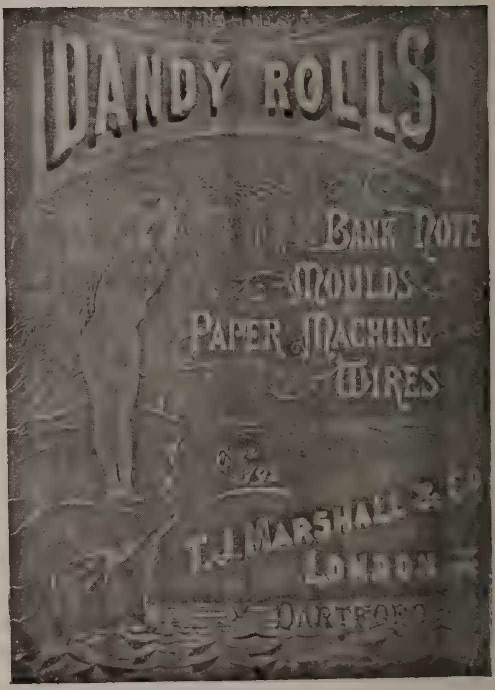

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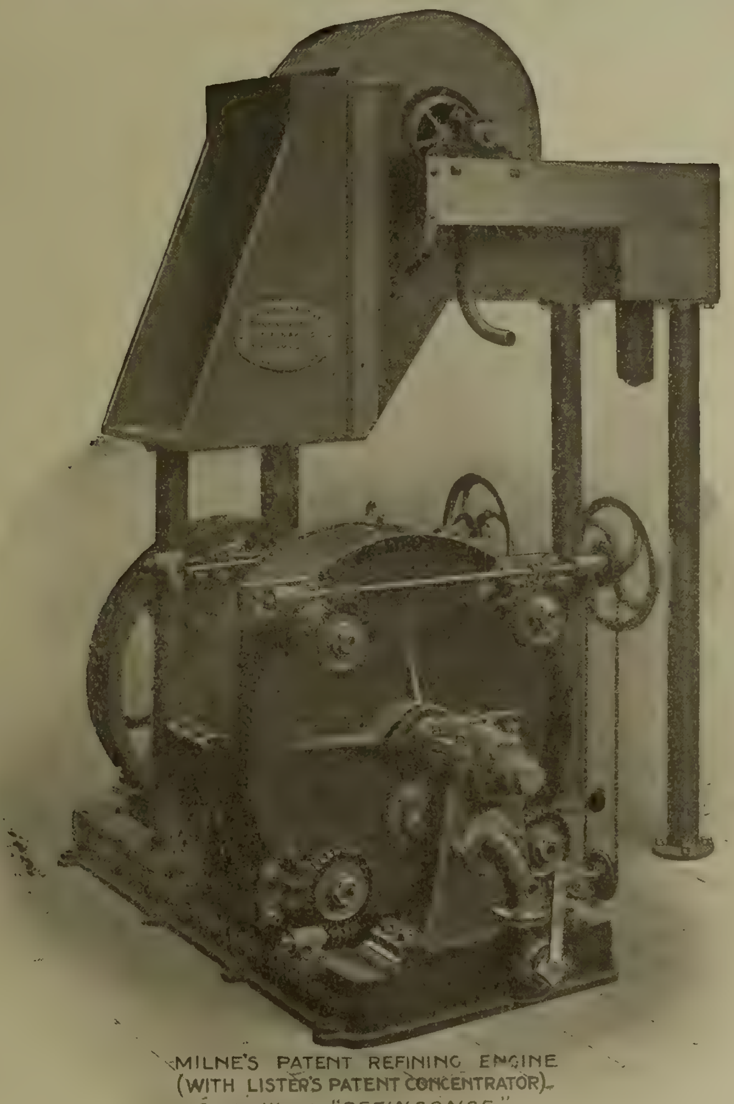

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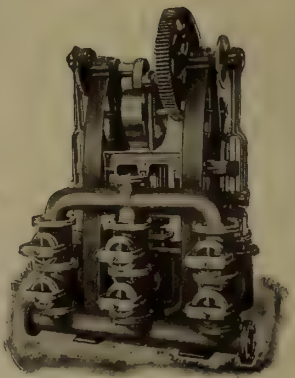

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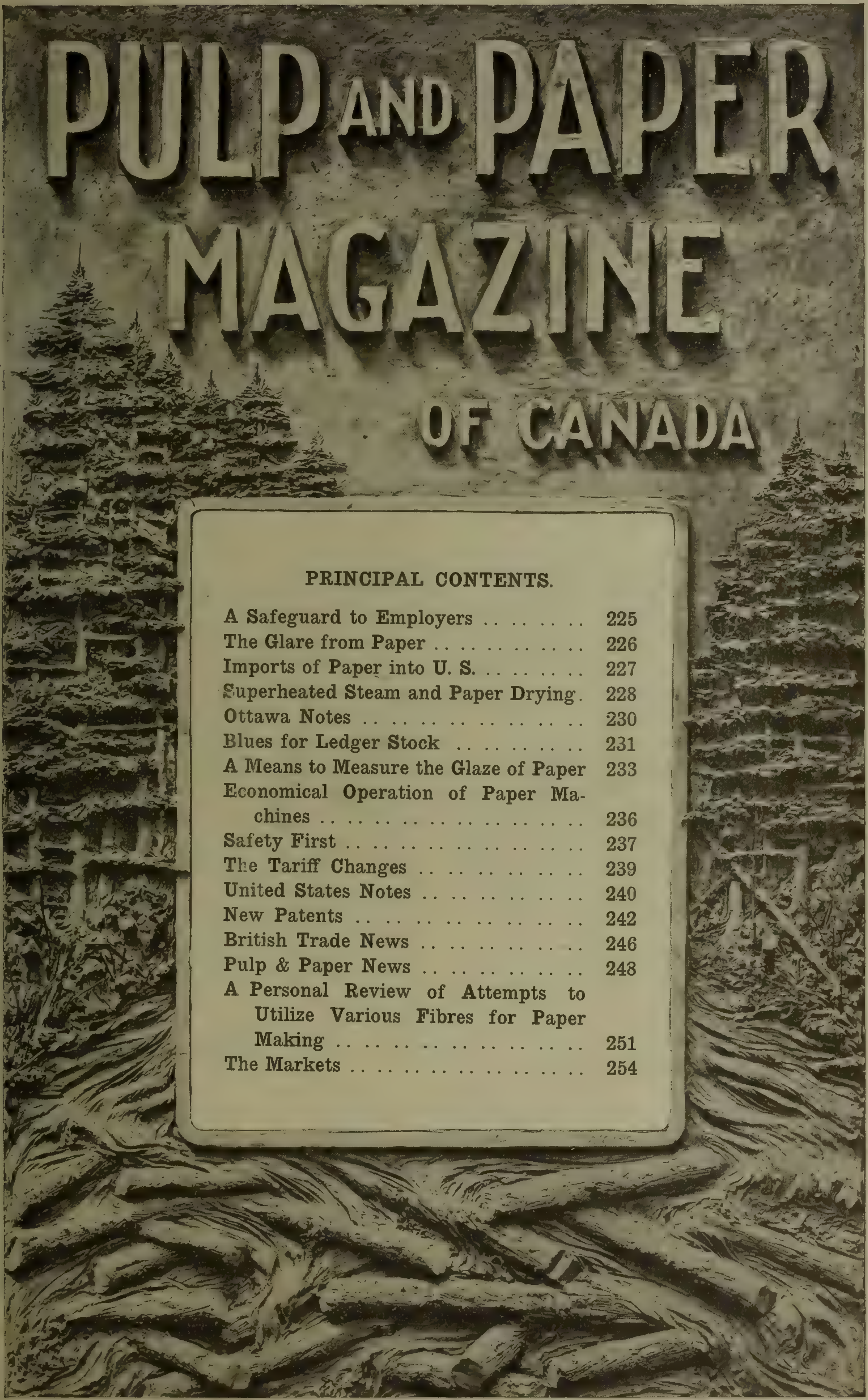

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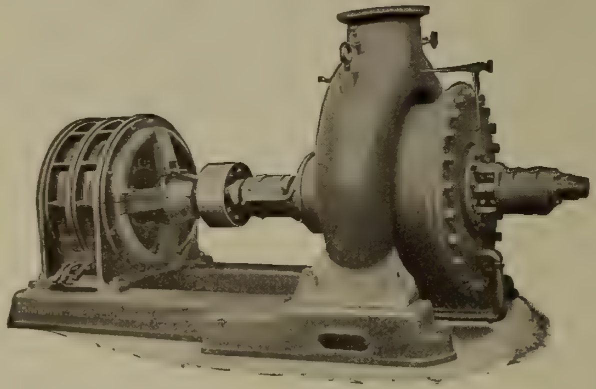

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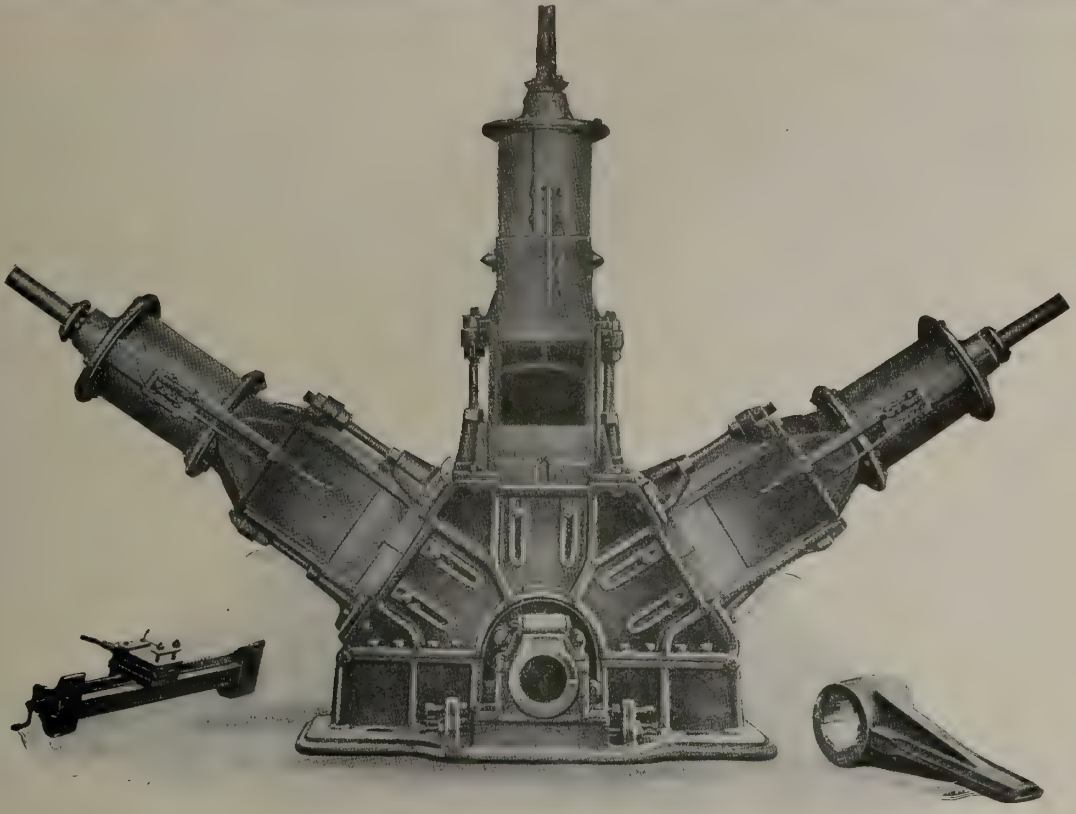

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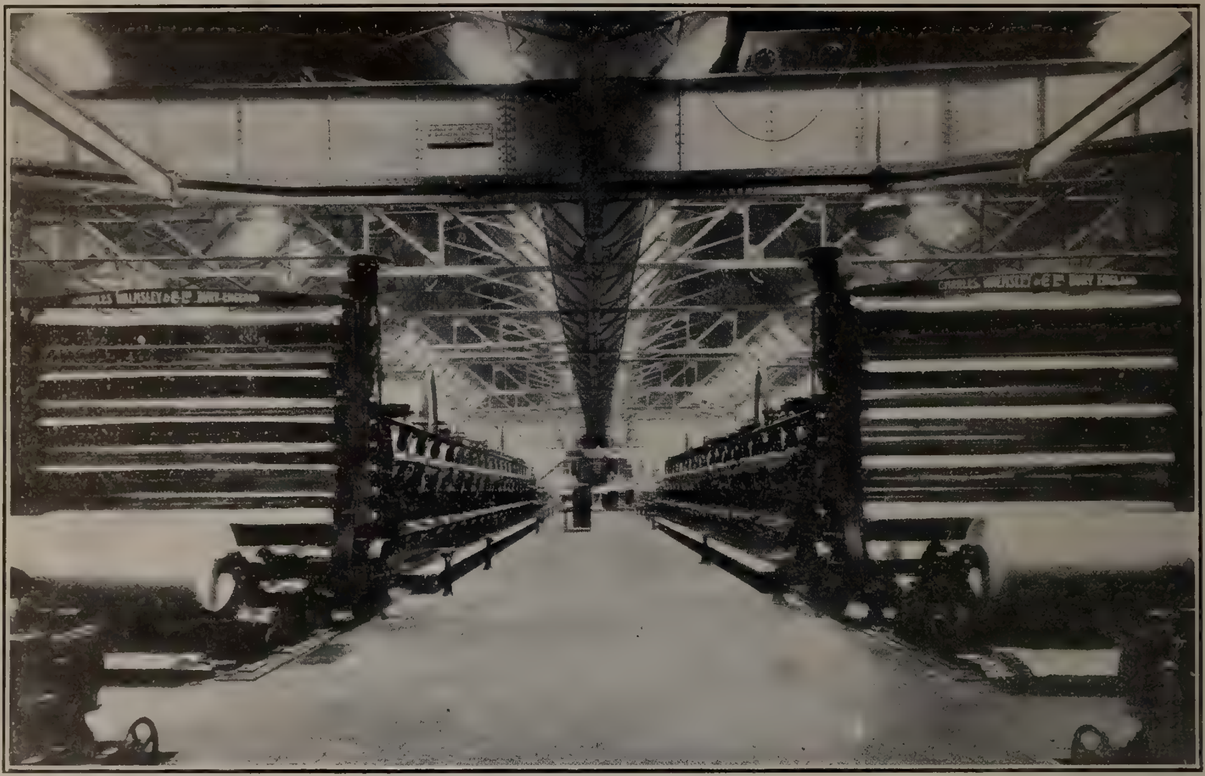
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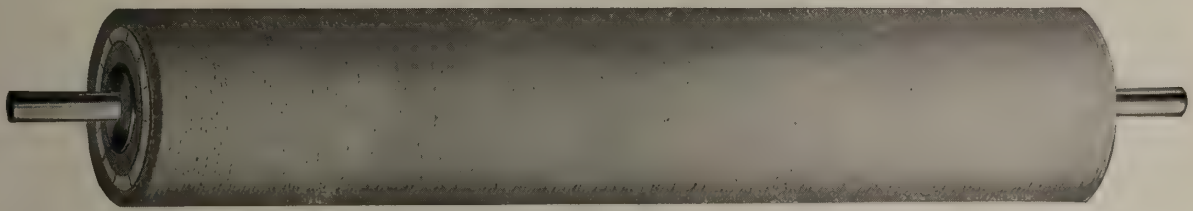

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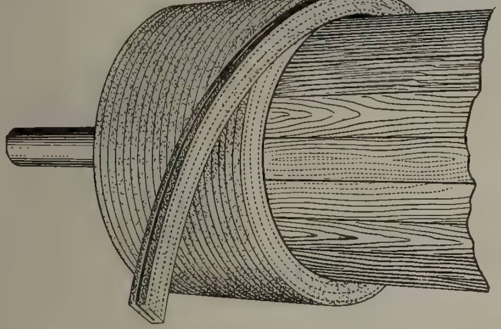

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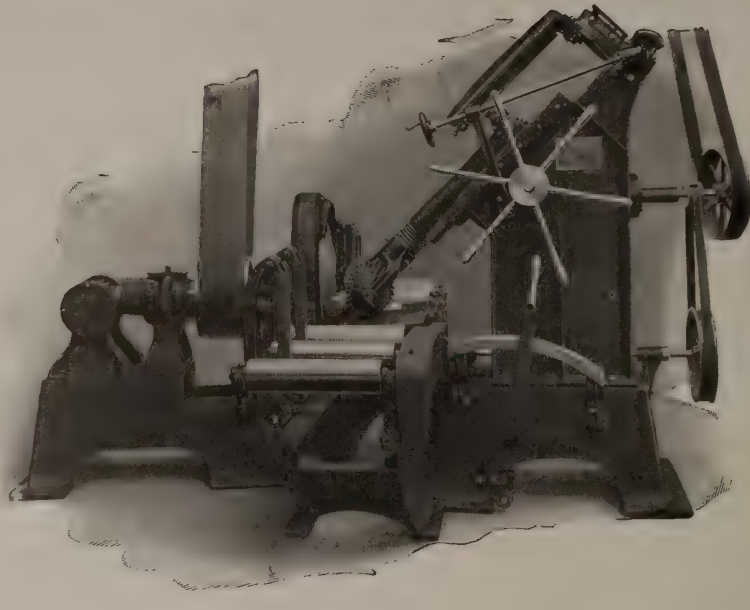

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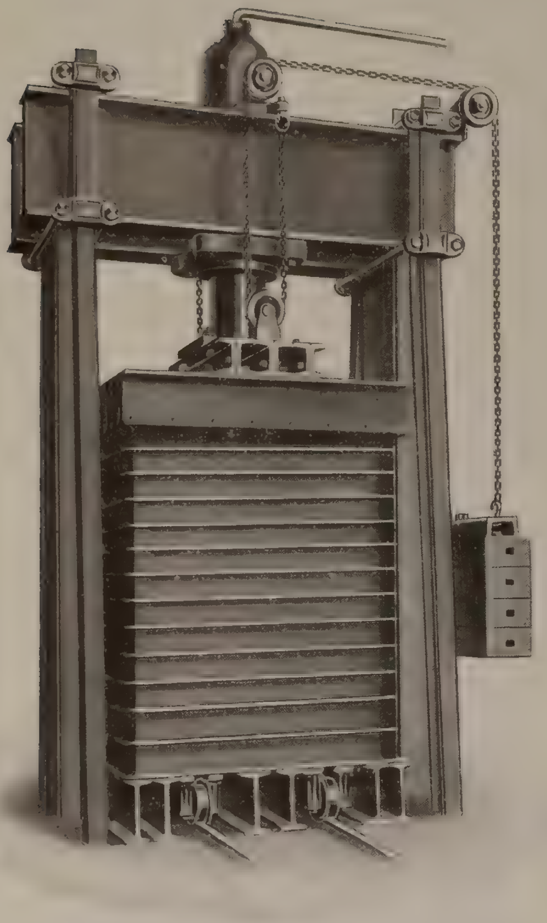

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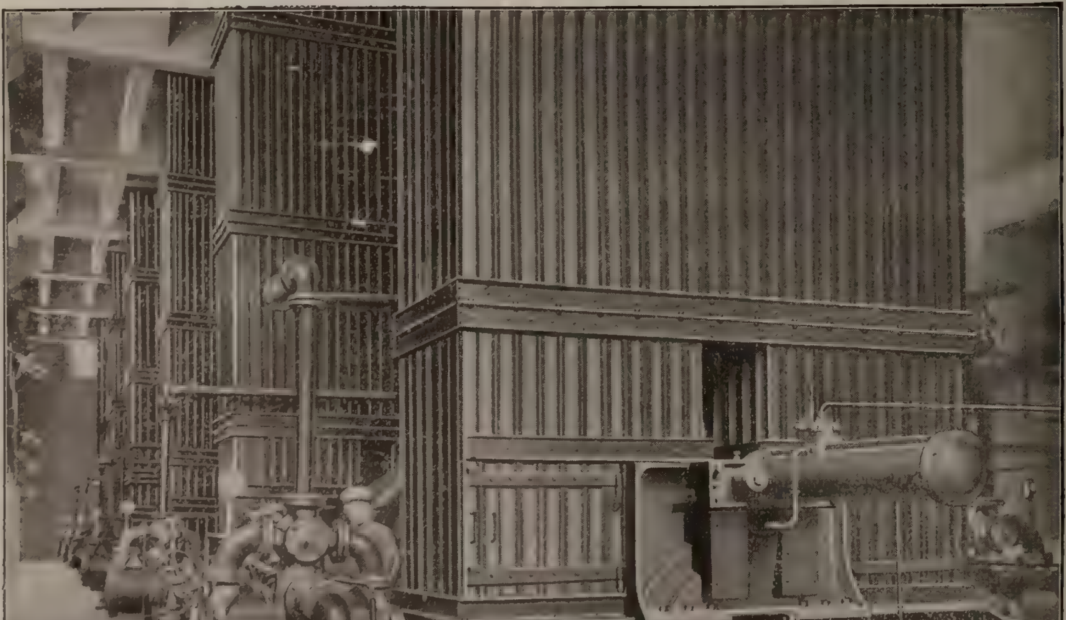

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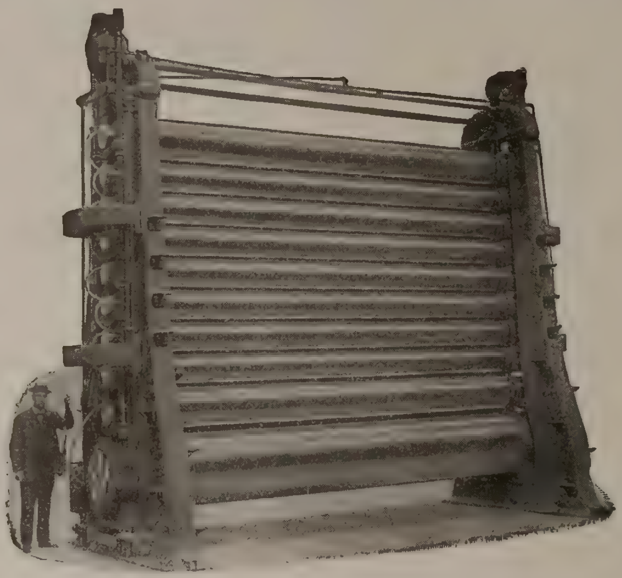

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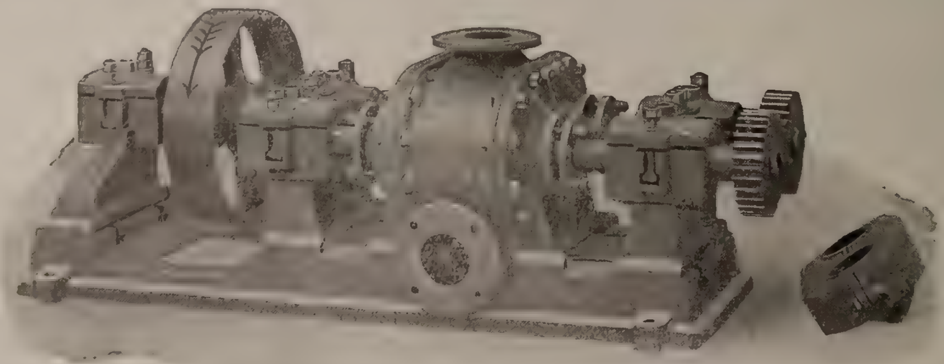

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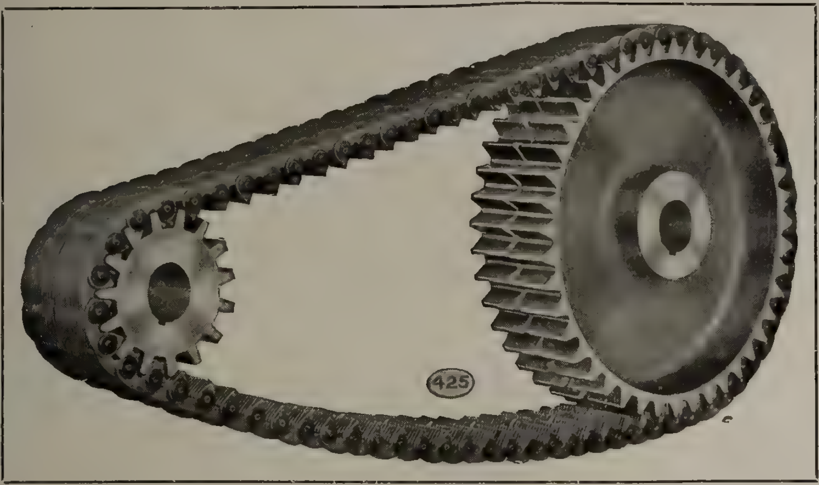

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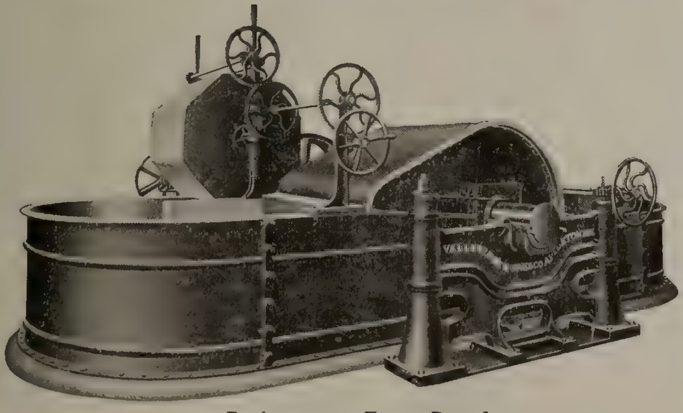

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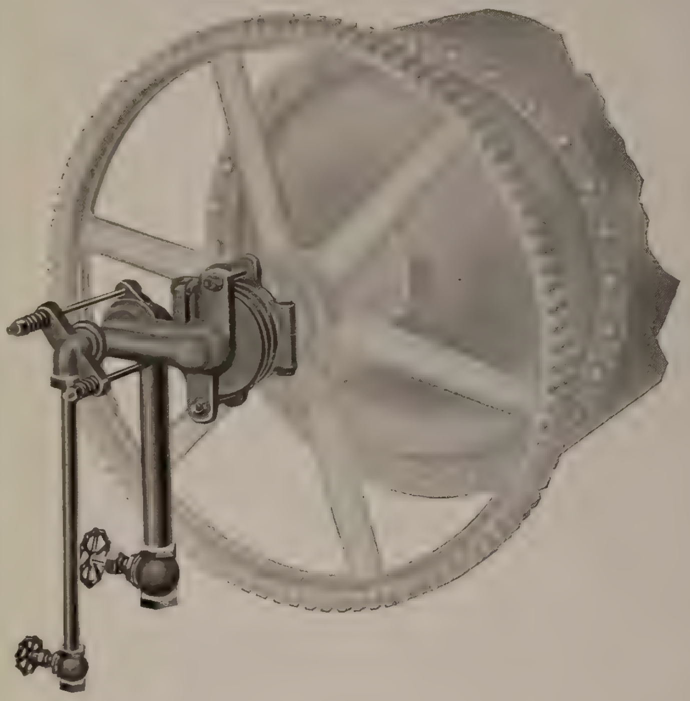

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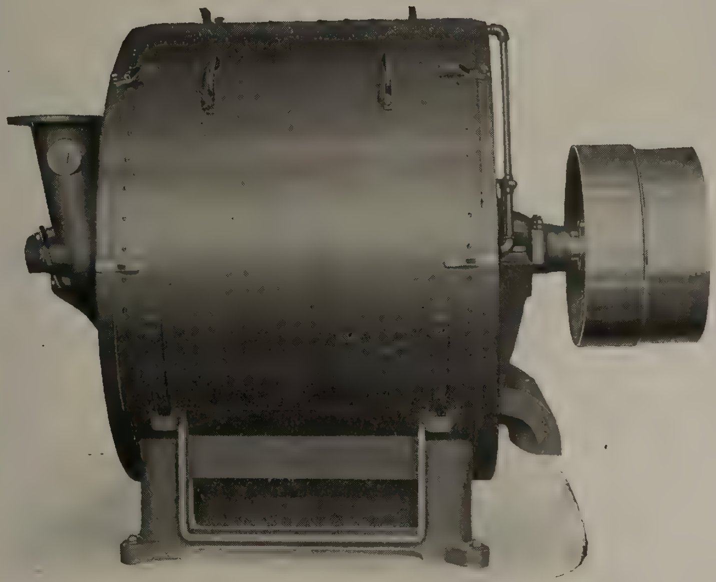

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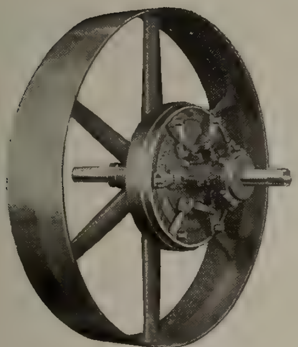

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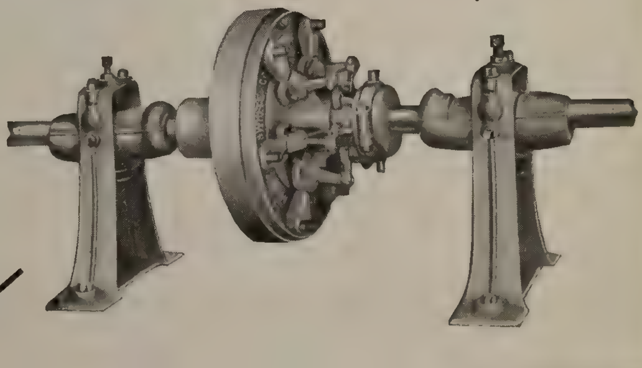

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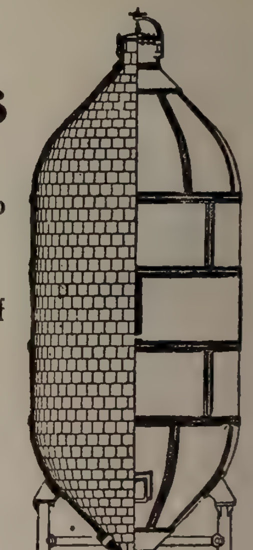

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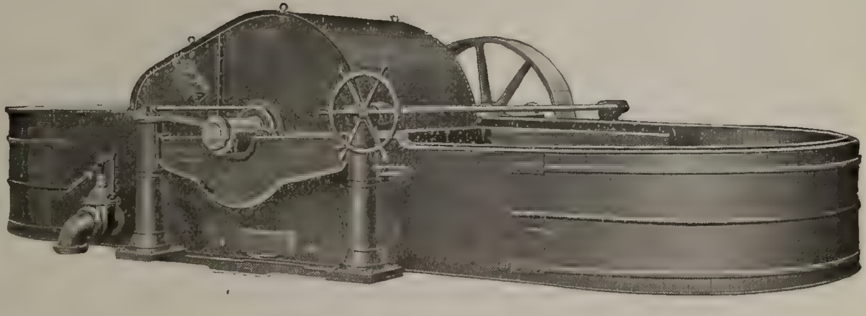

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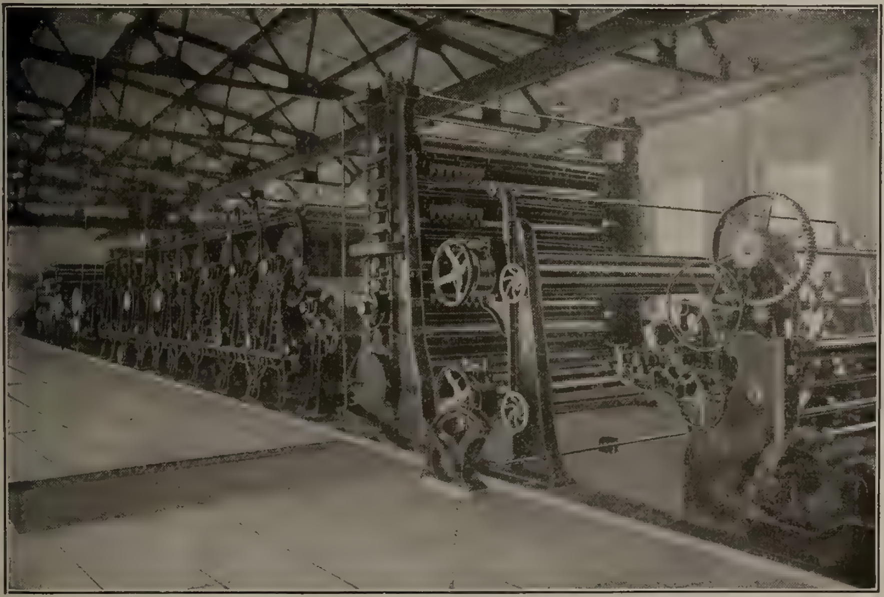

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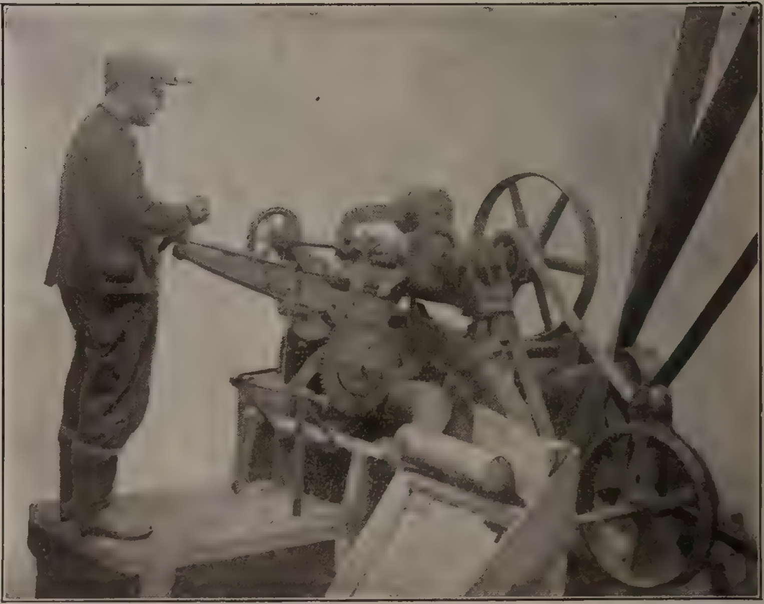

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VOL. XII. MONTREAL, APRIL 15, 1914 No. 8

A Safeguard to Employers

The manufacturers of Ontario have made another vigorous protest against the terms of the draft Compensation Act submitted to the Ontario House. In secret sesssion at Toronto a few days ago a large body of manufacturers debated the points at issue, and drew up a resolution, reached after long debate and discussion, which is to be presented to the Ontario Government in an effort to influence them toward making the act a piece of legislation equitable to both the employer and employee alike.

In order to reach any definite decision on the draft act as presented by the Commissioner, it is necessary to give the whole schedule most careful study. This most people have not the time to do, so that they are forced to rely on the findings of others more familiar with the acts in force in other countries, who have given the present schedules careful consideration. The members of the Canadian Manufacturers Association have done this with the result that a carefully compiled summary has been presented to each, by which it is made plain that many provisions of the proposed act would place an unnecessary and much too heavy burden on the manufacturers, and serve to bring about a condition not conducive to the best interests of either the workmen or the employers.

It must not be inferred, howver, that the manufacturers and employers are seeking to evade the law or cause to be enacted an act that would not be to the best interests of the whole community. In the first place, it was the pressure that was brought to bear by the Canadian Manufacturers' Association that influenced the present government to appoint a Committee to investigate the systems in force in other countries and draft a compensation act suitable to conditions in that Province. The manufacturers are anxious to have an act more just than any now in force, better than that in force in either England, Germany or the State of Washington, all of which are held as leading examples. Again it is to the interests of the manufacturer and employer to have such means of settling disputes that arise from injury to workmen in their employ. Such an act would relieve them of many undesirable complications that sometimes arise under present conditions. It would provide a means for settling compensation according to a fixed rule and would thereby prove a saving. At present employers very often take on unnecessary and unexpected burdens in order to do what they think best by the injured workmen, which in many cases amounts to a great deal more than would be obtained under law. The manufacturers are anxious for a compensation act, and have done all in their power to assist the Commission in drawing up a draft bill.

The draft bill presented undoubtedly places an unjust burden on employers, and if passed as it stands at present will not work to the best interests of the employe, as is anticipated. It would mean that rigid examination of all workmen and applicants for positions would ensue and unfair restrictions would be made. Besides, the burden placed on the employer, especially the small employer, would be so large as to unnecessarily raise the over-head expenses of his shop, thus placing him in an unfair position with his competitors from other provinces. It would mean the wrecking of many a small, struggling industry, which, if given encouragement, would in a few years be a great factor in the industrial life of the province.

Ontario cannot afford to place undue burdens on her manufacturers, and the labor classes should realize that fact. Employers are just as keen for a compensation act as the workmen are just as anxious to see it made equitable, so that it is to be hoped that the resolution of the manufacturers will be given careful consideration by those responsible for the passing of the Bill through the Legislature.

The Glare from Paper

A practical study of glare from paper in its quantitative aspects is outlined in this issue by Prof. L. R. Ingersoll, who has made use of the familiar principle that paper, in common with most other substances, polarizes that portion of the light which is specularly reflected from it. With most surfaces polarization is fairly complete at a certain critical angle. The proportion of polarized light reflected at this or any other angle can readily be determined by the use of some one of the forms of polarimeter, a convenient and ingenious type of which Professor Ingersoll describes. Such an instrument provides a rather handier way of investigating the specular reflection from paper than is found in the ordinary photometric processes for determining this quantity, and we hope that it will be freely used in practice to obtain data for the improvement of printing papers.

The tables of results reported by Professor Ingersoll are very striking particularly in showing the great difficulty of avoiding specular reflection and the effect of calendering on the amount of the surface reflection. As Professor Ingersoll shows, the varying texture of the paper produces astonishing variations in the amount of glare, the coated book papers being particularly high in specular reflection. Colored papers have almost as much surface gloss as uncolored ones so that the proportion of specularly reflected light, on the whole, is large in them. Some little experimenting will undoubtedly be necessary in order to determine from the measured percentage of specular reflection by this or any other process the working qualities of the paper as viewed by the printer. It seems now to be fairly well understood that even halftone cuts can be used successfully on paper with a much less glossy surface than was once supposed to be necesasry, even without particular attention to the character of the blocks. When the photo-engraver understands better how to make cuts for printing on unglazed paper the probability is that results of a very high class can be obtained without any particular difficulty, except perhaps in the case of some reproductions with intricate detail for which plate paper may still have to be used to secure the best results. However, the gain from the reduction of glare from paper is so marked in its relation to comfort in reading that publishers should make a serious effort to utilize matte-finished paper.

The Tariff Announcements

The recent budget speech of Finance Minister the Hon. W. T. White, was awaited with great interest by both the industrial and agricultural interests throughout the country. During the last few months influential deputations have waited on the government representing the milling, iron and steel, and agricultural interests, urging upon them necessities of one kind or another, so that the policy of the government, as was to be laid down in the budget speech, was awaited with considerable apprehension. In dealing with the tariff, Mr. White declared that the government adhered to the policy of moderate protection to Canadian industries, including the great basic industry, agriculture. This, he added, was the best policy for Canada, the policy under which it had prospered in the past, and could expect to prosper in the future.

There is no doubt that, situated as Canada is, protection in reasonable degree is helpful to industry, to those who depend on manufacturing enterprises for their means of livelihood, and to the communities which develop wherever a successful productive business is established and maintained. There is considerable objection here in Canada to that policy, but it must be upheld. The duties and changes suggested are reasonable, and good results should follow.

The Freight Rate Judgment

Judgment in the long drawn out western freight rates inquiry by the Railway Commission was handed down last week, making substantial reductions in western standard maximum rates, special distributing tariffs, through rates from east to west, local and westbound rates on grain and flour, coal rates in Alberta, special mileage rates on butter, cheese, eggs, dressed meats and dressed poultry, between prairie points; special mileage tariffs on vegetables in Saskatchewan and Alberta, and cement rates and rates on fence posts, fire-wood, brick, stone, gravel and sand in those provinces; as well as the rate on pig-iron between Port Arthur and Winnipeg. These reductions averaged from 5 to 30 per cent, but the judgment left untouched, because of their reasonableness, the through grain rates and through rates on nearly all products westbound, rates on live stock, the special rates on fruits and vegetables from British Columbia, cement rates out of Winnipeg, sugar rates from Vancouver, rates on smelter products from the British Columbia mines and local passenger rates in British Columbia, all of which were an issue in the case.

The judgment does not reduce rates on paper. Although substantial reductions have been made in all class rates west of Fort William, and Port Arthur, no reduction has been made in the commodity rates on paper under which the traffic moves. These, with other commodity rates were allowed to remain untouched, to be taken up later and dealt with on their merits in case of complaint.

The Finance Minister's Optimism

Canadians will take heart from the encouraging words uttered by the Hon. W. T. White, Minister of Finance, who delivered his annual budget speech early this week. In a year of world wide stringency in money matters, he was able to show a revenue of $163,000,000 and ordinary expenditures of $126,500,000, leaving a balance of $36,500,000. Probably the matter of most interest discussed by Mr. White was that relating to the financial stringency.

"From this time forward, until the culmination of the next economic cycle, we are on the economic experience of the past, justified in looking for much more normal monetary conditions. Bankers and business men unite in the opinion that while, it is a time for prudence and caution, it is also a time for confidence and courage. The strength of Canada lies in her vast natural resources. That is the rock upon which our prosperity is soundly based and founded. Any depression, generally speaking, can be but temporary in character, until such time as normal money conditions, joined with business confidence, again restores the wonted activity of the nation."

Imports of Paper into United States

An interesting bulletin was sent out the latter part of last week by the department of Commerce showing the imports of paper in the foreign trade of the United States and foreign countries. The bulletin says:

Imports of paper for use in the printing of newspapers and books aggregated 237 million pounds in the first five months under the present tariff law which transferred to the free list printing papers valued at less than 2½ cents per pound and reduced from an average ad valorem equivalent of about 15 per cent. under the old law to 12 per cent. the duty assessed on printing papers of a higher valuation. This total of 237 million pounds is double that for the corresponding period a year ago, a fact of interest in view of the tendency toward lower prices for newspapers, magazines, and other vehicles of popular information. At the present rate of importation the total imports of printing paper in the fiscal year ending June 30 next will approximate 535 million pounds, compared with 120 million in 1912.

The aggregate value of imports of articles connected with the paper industry, including, in addition to paper and paper products, pulp wood, wood pulp, and other paper stock, was $55,000,000 in the calendar year 1913. On the other hand, while the annual domestic production of paper and manufactures thereof had risen above $300,000,000 as far back as 1909, the exports in that line during recent years have never exceeded $25,000,000.

The foregoing facts epitomize statistics compiled by the Bureau of Foreign and Domestic Commerce of the Department of Commerce in connection with studies of our paper trade in its relation to the world's paper industry, regarding which comprehensive reports on production of materials, market requirements, etc., have been received by that bureau from consular officers abroad and are now being sent to the leading centres of the domestic paper industry for examination by those directly interested.

The importance of paper as a factor in international trade grows with the advance of civilization and general intelligence, ten leading countries enumerated below alone showing a total exportation of nearly 250 million dollars' worth of paper, books, maps, etc., or twice as much as ten years ago. In this trade Germany leads, her exports of paper in various forms having increased from 58 million dollars in 1908 to 76 million in 1913. In the same period those of Netherlands rose from 28 to 36 million dollars; France, from 16 to 32 million; the United Kingdom, from 23 to 34 million; and the United States, from 13½ to 21 million, while those of Sweden increased from 7¾ to 9 million; Belgium, from 7¾ to 12; Austria-Hungary, from 12 to 13; Canada, from 4 to 7; and Norway, from 5 to 6 million dollars.

World-wide opportunities exist for the sale of paper, for in every part of the civilized globe paper in various forms it is an article of necessity. The United Kingdom is the largest single market, having imported last year $40,000,000 worth, compared with $24,000,000 worth imported by the United States, $18,000,000 by France, $16,000,000 by Canada, $16,000,000 by Russia, $12,000,000 by Germany, $9,500,000 by Argentina, $8,000,000 by Belgium, $6,000,000 by Brazil, $4,000,000 by Japan, and $3,000,000 by Chile; while Greece, Sweden, China, and Bulgaria, each importing about $1,000,000 worth annually, and many other countries with smaller imports are nevertheless important as actual or potential markets for paper products.

Sales of American-made paper goods, while relatively small, are widely distributed. In the calendar year 1913 we sold 115 million pounds of printing paper in foreign countries, chiefly Australia and Argentina; and 10 million dollars' worth of books, music, maps, etc., one-half of it going to Canada and a considerable amount to other English-speaking communities. The South American republics, Cuba, Mexico, Germany and German colonies, France, China, Japan, may be mentioned among the numerous other countries to which our books and other printed matter were exported last year. These figures, however, do not include the vast volume of American trade literature, catalogues, etc., now going abroad. Our carbon paper was exported last year to the value of $400,000 for use in New Zealand, India, South Africa, and other countries. American-made wall paper is sold not only in Canada, but in less quantities in Portuguese, Africa and Australia. Our playing cards are exported chiefly to England, India, Hongkong and Canada, and in increasing quantities to Argentina, South Africa and scores of other countries. The $1,000,000 worth of American-made writing paper and envelopes exported last year included sales to all parts of the globe.

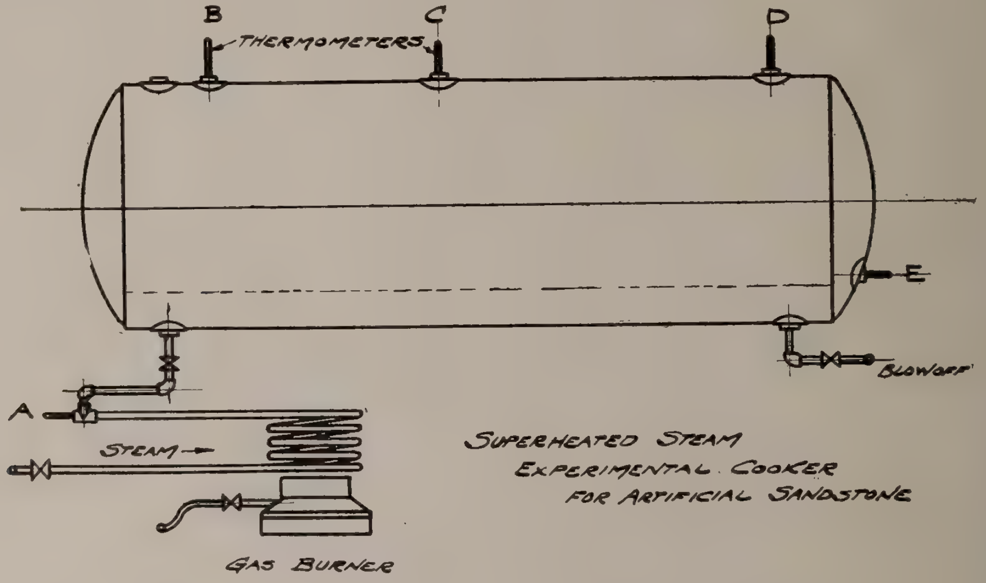
SUPERHEATED STEAM AND PAPER DRYING

By JOHN W. BRASSINGTON.

The fact that the application of superheated steam to drying problems is often discussed, and like Banquo's Ghost, will not down. make it a duty incumbent on those who have actually tried the efficacy of the application to make public their experience with it. There is something about certain engineering operations, noticeably "fuel burning," "steam generation" and "drying operations" that neophytic engineers seem to find irresistible, so even as a moth flees to the light, so they try their prentice hands at such engineering problems, until burned and wiser, they charge up their hurts to experience. Unfortunately there are always amongst these experimenters some who will not see the fallacy of their theories, either because they are hynotized by the fact that the device is their own design, or because they dishonestly crave their "thirty pieces of silver." It is, therefore, doubly necessary that the truth when known should be told by each searcher for the real facts, as far as his own experience will enable him to do so, if only to confound those who are either unable or unwilling to furnish an unvarnished tale.

The experience of the yard was that the higher the pressure, and therefore ,the higher the temperature, the shorter was the time required to cook; hence everyone believed that by using superheated steam we would not only cheapen the construction of the cookers, but that we would vastly increase the output of the plant, using the same apparatus and the same amount of labor.

In order to try out the possibility of the scheme, we had a miniature cooker made, and we used superheated steam in it during a series of experiments for two or three weeks, using all degrees of superheat. Those amongst us who were engineers, soon realised even at the beginning of the first experiment, that superheat is not applicable to an economical or to a uniform system of drying, because there is no conduction and no convection of heat in a gas like superheated steam. Superheated steam is a poor conductor of heat and has not automatic convection qualities like water for instance, that, although a poor conductor of heat, yet transfers and diffuses heat in its body by means of the motion of the particles of the mass, a process technically called convection.



SUPERHEATED STEAM
EXPERIMENTAL COOKER
FOR ARTIFICIAL SANDSTONE

About five years ago, the writer was called upon in the capacity of Consulting Engineer, to consider the advisability of using superheated steam in the cookers of a stone yard making artificial limestone and limestone bricks. The bricks or stones, when made and moulded to form, were placed in closed steel cylinders and cooked at a temperature of from 350 deg. to 365 deg. F. for several hours; this temperature was maintained by filling the steel cookers with saturated steam at a gauge pressure of from 125 lbs. to 150 lbs. This high pressure, of course, called for the use of very heavy and expensive cookers, as well as necessitating the employment of high-class labor. It was, naturally, a very tempting possibility to consider, whent it was proposed to do the same work with steam at only 5 lbs. pressure, superheated from its equivalent saturated temperature of 228 deg. F. up to any temperature that might be found desirable, in order to get the best results.

Referring to the figure showing our experimental cooker, we would have, for instance, 700 deg. F., reading at thermometer A, and 220 deg. F. at B, C, D and E, nor could we get any higher readings until we opened the blow-off valve, and then we would have readings of say 650 deg. F. at B and C, with 220 deg. F. at D and 650 deg. F. at E. The possibility of thermometer error was obviated by repeatedly transposing all the thermometers, practically the same readings being obtained.

It was the desire of the experimenters to ascertain whether it was possible by forced circulation, to use superheated steam by either using a fan or by blowing off as economically as possible; both these methods failed because of the inertness of the superheated steam and its small heat carrying capacity. The specific heat of superheated steam is much lower than that of saturated steam, and while the temperature is high the quantity of heat is small; it is, so to speak, like trying to warm your hands on a frosty day with a lighted match; it is hot enough to burn, but there is not enough heat to do the work required of it. The lack of conductivity of heat of superheated steam makes it impossible to supply heat for the purpose required, to replace that taken away from the heat supplying medium by the process in question.

Now let us suppose it is our purpose to use superheated steam in the dryers of a paper machine, and with this object in view we should introduce it through the steam joint of a dryer, at a temperature of say 300 deg. F. and at 10 lbs. pressure, that is, with about 40 deg. F. of superheat; it would probably be considered impracticable to use steam of a much higher temperature. This superheat, however, be it high or low in temperature, can never reach the other side of the dryer, because all of it that is not spent and wasted in heating the head of the dryer on the driving or entry side, to a higher temperature than the rest of the dyer, must be obliterated by the water of condensation. This condensate covers the inner walls of the dryer, held to them by the centrifugal force due to the revolutions of the dryer; and superheated steam cannot remain superheated when in contact with water.

The use of superheated steam in a paper machine can only result in a local heating of one end of the dryer, and so to a consequent spoiling of the paper; there are other troubles, however, that accompany an effort to use superheated steam in a drying operation; it will for instance, infallibly destroy the reliability of any temperature control device, because of its own insecure hold on its own temperature, a sprinkle of condensation on the incoming superheated steam (surely not an inconceivable thing to happen inside a paper dryer in use) may destroy 40 deg. or 50 deg. of superheat almost instantaneously, then what may become of a thermostat control if it happens to be in the dryer?

As the supply of superheated steam must from the nature of things be at a fairly constant temperature, and because of its low specific heat, that same supply must also be in a condition of unstable heat balance (if we may coin a new engineering phrase) therefore, irrespective of all other objections,, the use of superheated steam in the dryers of a paper machine must add greatly to the importance of the now practically unknown factors that control the equitable distribution of the steam in the main header. A writer in the "Papier-Fabrikant" states:—"In a dry part consisting of seven top and six bottom cylinders, I had the following trouble: A great many fibres stick to the first drying cylinders above and below, and the cylinders in question looked as if they had been painted with white lead. In 'look-through', the paper looked quite pustulated; the more size I added the more the ductors had to do, and the worse did the 'look-through' become. At last I hit upon the following idea. I inserted in each flange, a sheet metal disc whose central opening was 3mm, and my troubles were over with."

Too much heat or steam in the first few dryers is apparently not a good thing for a heavily loaded paper; it is better perhaps to supply the steam header with steam at a point somewhere between the calenders and the presses, preferably nearer the presses, and then arrange for the control of the distribution of the steam by an additional valve in each run of pipe. If, however, you are handling superheated steam and on Monday morning there is much water in some dryers and none in others, then there will be inversely low heat in some dryers and high heat in others, though the high heat will be at one end only of the other dryers; it follows then, that the steam distribution control would vary from that required after a few hours' run. An unequal localisation or distribution of heat, such as much obtain with the use of superheat in a nest of paper dryers must prove harmful, if not fatal, to the successful operation of the machine.

In conclusion, let us consider the actual physical conditions that would exist could superheated steam be used, and compare them with the actual physical conditions that exist when saturated steam is the heat carrying medium. Let us take a dryer 48 in. in diameter, 120 in. face, and fill it with saturated steam at 5 lbs. gauge pressure and maintain that pressure with a constant supply. At any given moment this dryer will contain approximately 125 cubic feet or 6¼ lbs. of steam carrying for delivery to the paper that is to be dried, 7,200 B.T.U., the temperature of the steam being 228 deg. F. Then the transference of heat is proportioned to 228 deg. — 212 deg. = 16, giving a flow of heat through the shell of dryer that is uniform and constant. Now let us suppose an impossible thing, i.e., that the dryer is full of steam at 5 lbs. gauge pressure, uniformly superheated all through the contents of the dryer; let this degree of superheat be 150 deg., giving a total temperature of 378 deg. F. Then the dryer contains as before 125 cubic feet of steam, but it only weighs 5 lbs., and in spite of its high temperature, it only contains 6,200 B.T.U. as available heat, ready for transference to the paper that is to be dried. The transference of heat for the first second of time (now we have assumed we have filled our dryer with this superheated steam, by defying the laws of nature) is proportional to 378—212=166 that is, it is over ten times as great as when the steam was only saturated steam. Now let us assume (what is nearly correct) that 4 B.T.U. per square foot of surface are transferred per degree difference of temperature per minute; the paper covers about 80 square feet of the dryer, so in the case of the saturated steam, 4,480 B.T.U. are lost by the steam in the first minute, so if we have a 2in. steam pipe the flow of the make up steam must be equal to (4480 × 125) ÷ (7200 × .023) = 3800 feet per minute.

In the case of the superheated steam, if we suppose the initial transference of heat to be sustained for a period of one minute, we have an equivalent figure to the one given above for transference of heat in the first minute of 50,000 B.T.U., instead of 4480 B.T.U. This evidently means a speed of steam of 38,000 feet a minute through a 2 in. pipe, or else the use of a pipe of sufficient area to give say 6,000 feet per minute steam speed, that is a 7 in. pipe supplying one dryer.

As a matter of fact, it is impossible to transfer heat by means of superheated steam by any means except the mechanical movement of the steam, by, for instance, brushing away and discharging all steam as waste to the atmospheer as soon as its superheat is given up, and then replacing it by a like quantity to be in its turn wasted; such a procedure is, of course, absurd, as all the latent heat, or about 90 per cent of the total heat, would then be wasted; the figures given in the preceding paragraph are given to illustrate the fact that should it be decided to uses superheat anyhow, in spite of the enormous heat loss involved, that after we had made full arrangements to maintain a sufficient flow of steam to do our work in a small dryer 48 in. in diameter and 120 in. face, we would require a 7 in. pipe to keep our dryer full of enough steam; this would mean a main heater (supplying the nest) if we put our steam in about midway, so as to supply the two branches equally, of 27 in. diameter, fed by a 39 in. diameter inlet.

The arguments given in this article are based on a disappointing experience of the writer's as described in the beginning of this writing; it must be evident to the reader that as he reads, there is an effort possibly at special pleading and a desire to destroy all the hopes of our superheating friends; the writer acknowledges this frankly, but this effort is aimed only at such nefarious charlatans that infest the engineering "profession," and use their quasi-engineering knowledge for the purpose of swindling better men out of their hard-earned cash. It is not the intention of the writer to browbeat or confound, but rather to help the honest investigator, and it is hoped that any such will rigidly criticize this article and sternly call the writer to account for anything therein that is inaccurate and misleading, for it is his ardent desire to be so corrected, whenever found to be in error.

Ottawa Notes

TARIFF CHANGES SLIGHT.

Ottawa, Ont., April 10.—The long expected tariff announcement of the Minister of Finance, Hon. W. T. White, was made in Parliament last week. It saw only two changes affecting the paper industry, and those minor ones. The tariff, however, does not appear to please the paper trade ,its sins being rather of omission than commission, according to one typical view expressed by Mr. W. H. Rowley, president of the E. B. Eddy Company.

One change made by the new tariff is in connection with decalcomania paper, which instead of being left in the unenumerated list and therefore dutiable, is made free. Twine or yarn of paper when imported to be used in the manufacture of furniture, which was formerly dutiable under a general tariff of 20 per cent is also made free.

Of the tariff, Mr. Rowley declared that while in many respects the revisions were wise there were two points on which he did not agree with the proposals. In the first place he considered the farmers in Canada had already got too much, and were going to get still more under the revisions. In the second place, he believed the changes would bear too heavily on this industry. "I think the tariff will bear pretty heavily on this industry," he said. "I would have liked to have seen some changes there." But Mr. Rowley would not say just where the weight would come or what changes he would have liked. His position, he stated, made it rather difficult for him to make a statement on the matter. On another point he would have liked the Government to have gone further, in the matter of duties on bituminous coal, which enters into the manufacture of paper as in that of many other commodities. He would have preferred a free interchange of this commodity in the way of an agreement to make coal free.

The Western Freight Rate Judgment.

Another announcement of vital interest to the Canadian paper trade is the publication of the judgment of the Railway Commission in the Western Freight Rates inquiry. This case, which has been under consideration in one form or another since 1904, is said to have had its origin in an agitation started by some Winnipeg papers which considered they were paying too high rates on their news print. The judgment, however, does not reduce rates on paper, according to what was learned by your correspondent from an official of the Railway Commission.

Both news print and building and roofing paper nominally come under the 5th class, rating as regards railway tariffs. As substantial reductions have been made in all class rates west of Fort William and Port Arthur it would therefore appear that lower rates would be paid on paper. As a matter of fact, however, the traffic has really moved under what are known as the commodity rates on paper since these are lower than the ordinary fifth class rates. They are also somewhat lower than the 5th class rates even with the reductions which have been ordered. No reduction has been made in these commodity rates on paper, these with other be taken up later, and dealt with on their merits in be taken up late and dealt with on their merits in case of complaint.

During the hearing a series of rates on paper was presented by counsel for the different provinces which were asking for lower rates, to show that these were higher than were being paid by American shippers in the Western States. Despite this, however, the Railway Board has not ordered any relief to Canadian shippers of paper. The rates on lumber are also left untouched, but these were reduced by a previous order, and are now considered low enough.

Celebrates 87th Birthday.

Mr. John R. Booth, the grand old man of the lumber and paper trades, and head of the J. R. Booth firm, last week celebrated his 87th birthday. Mr. Booth has now in great part recovered from the injury he sustained some months ago, when he was struck by a falling timber and laid up for a time. He still has to use crutches, but is able to visit his plant and direct the work there as usual in spite of his advanced years.

Sir Wilfrid's Prediction.

That within the lifetime of the younger members of the House of Commons the greater portion of paper manufactured on the American continent would be manufactured along the line of the Grand Trunk Pacific Railway was the interesting prediction made by Sir Wilfrid Laurier, leader of the Opposition in Parliament, during the debate on the National Transcontinental Railway a week ago.

"We know that there are immense rivers flowing from the mountains towards Hudson Bay with immense capacities of water power development," said Sir Wilfrid. "We know, further, that the resources in pulpwood are incalculable and that if the Governments of Quebec and Ontario are wise and understand how to husband their wealth, these resources will be inexhaustible for all time. It is not a rash prediction to say at this moment that within the life of men sitting in this chamber, the greater proportion of the paper manufactured on the continent of America will be manufactured along that line of railway."

The Georgian Bay Canal Inquiry.

One of the duties of the newly appointed Georgian Bay Canal Commission, which entered on its offices a week ago, will be to "inquire into the pulp industry, and the possibility of development along the line of the waterway," to quote one clause in the Order-in-Council creating the commission. The commission consists of two Montreal members, Col. F. S. Meighen and Edouard Gohier, and a Winnipeg man, Mr. Sanford Evans, as chairman. It will take up the question of the commercial feasibility of the canal and, in this connection will look into the matter of waterpower development as well as the pulp resources of the district through which the waterway will pass — which have long been known as very extensive—and a variety of other questions. It is predicted that with the construction of this canal and the operation of the National Transcontinental, the center of paper production in Canada will shift considerably farther west than fixed at present.

MAC.

BLUES FOR LEDGER STOCK

By Harry A. Maddox.

The colour of paper made for loose-leaf ledger and account book work is a factor of more than ordinary importance. The higher grades of paper are required to maintain a good all-round condition for very many years. It avails little that the material is carefully selected and treated if the colour fades and gives place to a dirty yellow appearance. Yet this is precisely what is happening in the case of the greater proportion of ledger paper now turned out. The introduction of cheap mineral colours and the popularity of organic dyes have considerably reduced the prospects of permanence in the lower grades of machine-made stock. The finest type of azure colouring (or blueing) now performed is that executed on No. 1 grade English hand-made ledger paper. The colouring matter used in this stock is the same that has been used since ledger paper came into being, namely, smalts.

The principal blues used on medium and high quality stock are smalts and ultramarine, although latterly indanthrene has come largely to the front, principally in the United States. The latter dyestuff has not yet come into vogue in England, but there is little doubt that when its properties become thoroughly appreciated it will find its way into many middle-grade machine papers.

The very best ledger papers in England are still coloured with smalts of a very fine quality. The next grade employs a secondary class of smalts or a mixture of smalts and ultramarine. If the price will not stand smalts, pure ultramarine is resorted to, and in any case if a bright, clear hue is desirable, ultramarine is preferred as giving the best results. This mineral blue has several advantages over smalts, other than in the matter of price. For one thing, it mixes well and with ordinary care does not speckle the paper; again, it yields an incomparable shade of blue, of an opalescent character and very little dye is lost in the backwater. For permanence and fastness against the influence of outside and foreign reagents ultramarine cannot compare with smalts. The price of smalts, however, debars it from entrance into any but the best and more expensive sorts of ledger paper.

In order to appreciate the properties and characteristics of each type of colouring material, it is advisable to devote space to a more extended consideration.

Smalts is a mineral blue pigment possessing a rather low colouring power. It is produced from cobalt glass, ground and pulverized to an exceedingly finely divided state. Chemically it is regarded as a mixture of potassium and cobalt silicates. The actual composition varies considerably according to the grade of colour. The extent of the variance has been stated as: Silica, 56 to 70%, potash, 12 to 22% and cobalt, 6 to 16%.

The dyestuff is absolutely fast to light, air, fumes, gases, acids or alkalis. Age does not impair the purity of the shade in any degree, hence the colour of a smalts dyed ledger paper from first quality linen material is about the fastest thing known in tinted stock. The blue of smalts is rather a subdued tone compared against ultramarine. The presence of the pigment in any paper may be detected by the prevalence of minute specks on the under side. It is not safe, however, to place too much reliance upon mere appearance, for some of the duller shades of ultramarine make a good imitation of smalts, in addition to which there is a probability of specks occurring. If it is necessary to definitely decide which of the two colouring matters has been used in a paper an incineration and test of ash must be made, for it is very possible that a mixture of smalts and ultramarine may have been used.

Specks are a chief source of trouble and difficulty with all mineral pigments. If they find their way in large quantity into high grade pulp the market value of the ultimate paper is apt to go down considerably. In the case of smalts, the travel over the sand table abstracts large numbers of the pigmentary particles and helps to bring others to the bottotm of the pulp by virtue of their high specific gravity. On reaching the wire and suction rolls and boxes the downward pull of the latter, plus the native tendency of the heavy mineral, combine to bring the colour and specks to the underside of the paper. To counteract this to a great extent an improved mixer may be used. It is very essential that the most finely divided smalts be selected and strained through fine mesh cloth after thoroughly dissolving, also that the pulp be kept on the thick side as much as convenient. Otherwise the colouring stuff will run through very speedily with the fall of the water. The shake needs to be regulated to a firm and not too rapid action so that the particles may remain in suspension.

Ultramarine is described as a double silicate of sodium and aluminium together with bisulphide of sodium. It is a colouring matter that runs in several grades, varying in composition, quality and shade, the latter varying from an almost violet hue to greenish blue. In the mill, it becomes essential to control the colour and power of the various consignments of mineral received, by mixing to a paste with known proportions of china clay and glue and comparing against a set standard.

The real original ultramarine (not used in papermaking) was prepared from a rare and costly type of stone, the lapis-lazuli. Ancient Egyptian monuments bearing paintings over 4,000 years old still exhibit these blue pigments in all its original brilliance. Commercial ultramarine is prepared by fusing together silica, alumina, soda and sulphur, the last ingredient being the most dangerous as an impurity in the ultimate colour, hence most carefully controlled in the case of the highest grades. If traces of sulphur or injurious sulphides are at any time suspected in the pigment, as it arrives at the mill, a very simple but efficient test determines the presence thereof. Make up a paste of the blue with distilled water and apply to a clean copper plate. Allow the mixture to stand for about 24 hours. If there is sulphur residue in the ultramarine the plate will show signs of blackening, due to the formation of copper sulphide.

Ultramarine is very fast to light and alkalies, but is vigorously attacked and bleached by mineral acids, hydrogen sulphide being evolved during the process. The effect of nitric acid upon ledger paper may therefore be used as a test for the colouring matter. It does not need the direct application of acid to destroy the colour effect of ultramarine; acid fumes for instance, have a deleterious effect. Coal and gas burning results in the formation of gases in the air which also attack the tint of ledger stock in measure according to the amount and nature of the said gases in the atmosphere.

Principally, coal and gas burning results in the evolution of carbonic and sulphurous (afterward transformed to sulphuric) acids. It is particularly noticeable on many old account books that the edges of the leaves have become badly yellowed, although the paper itself maintains its nature and strength. It is a matter of much importance that books carrying records, deeds, register of events, and in fact information of any permanent interest, should be coloured with pure, unfading and non-reactive dyestuff. For this reason, ultramarine, if it is to be used at all, must be of the highest state of purity, more particularly in regard to traces of sulphur and sulphides. Smalts, however, embodying as it does a perfect guarantee, should most certainly be given the preference if at all permissible.

Chlorine and its oxides have a vigorous bleaching effect upon ultramarine. The presence of chlorine in paper, in a free state is perhaps a most unlikely occurrence, although it is not an impossibility. The most probable result of overbleaching or residues of the chemic is the formation of oxycellulose and chlorine oxides. In contact with ultra-marine and aided by the heat of the drying cylinders there is distinct possibility of a degradation of colour. The action is in fact (as it also is with mineral acids) a proper bleaching action, for the colour goes directly toward white.

Probably the most aggressive opponent of ultramarine as a colouring material, is alum. In the case of the lower grade account-book papers, alum goes into the pulp in fairly large proportion as an ingredient of the size, in combination of course with resin. The redder shades of ultramarine are far more susceptible to the onslaught of alum than the greenish variety, hence for engine sized pulp they should never be entertained. In actual practice it is more practical and economical to resort either to indanthrene or an organic substitute. Higher grade pulp, intended for ultimate tub-sizing and loft or air drying often takes a small percentage of alum and resin in order to produce a firm web, sized throughout, and incidentally to effect some degree of economy in the gelatine usage. It is very necessary, even here, to keep the proportion of alum as low as convenient if the fullest effect of ultramarine colouring is to be secured and ultimate degradation counteracted. In the case of hand-made paper and the absolutely highest grades of loose-leaf ledger paper, no alum whatever is introduced into the pulp, but a small amount goes into the gelatine or glue. Here, again, if ultramarine is the selected colour, it is essential to keep the alum at the minimum, and free from acid.

The presence of free acid in alum is hardly to be expected on the better grades, but it is necessary to keep a control over mill supplies. Lower grades have often been found to exhibit traces of active acid. The usual test, consisting of adding alcohol to the powdered and dried sample, extracting the acid and titrating with decinormal caustic soda in the presence of methyl orange, should be applied at regular periods.

Heat promotes reaction, and excessive heat promotes rapid decolouration, where alum and ultramarine are concerned. The blue of an engine sized ledger paper may be practically ruined during the traverse over unduly hot drying cylinders. Therefore, in the case of either whole or part resin sized stock the temperature must be sufficient to just perform the drying without overheating. So far as tubsized paper is concerned there is no need to aim at absolute dryness until after the application of the glue.

The results of a simple trial of the effect of alum may usefully be appended at this stage. Four batches of handmade sheets were prepared from bleached cotton stuff. The first contained 2% resin and 2% alum, the second, 2% resin and 4% alum, the third, 2% resin and 6% alum; all three were dyed witth 1%. A quality light blue ultramarine. A fourth batch consisted of the same pulp, sized 2% resin, 4% alum and no colouring matter. After pressing and drying over a heated cylinder the sheets were examined and found to reveal varying depths of shade, increasing proportionately in shade between No. 1 and No. 2, and No. 2 and No. 3. For three years consequent upon this, the sheets lay enclosed and away from light or other possibly adverse influence. After this period they exhibited the same ratios of shade variation but all had become quite bleached round the edges The white sample remained perfectly pure and unaltered in any way. Obviously the effect of alum increased in proportion according to the amount added to the pulp. In every case its influence during storage was adversely felt, and this on a good quality of ultramarine.

The latest comer in blues for azure stock is indanthrene, a pigmentary dyestuff, insoluble in water and claimed to be fast to light, air, acid and alkalies. It is used in the oxidized state and is in some instances replacing ultramarine on account of its claim for superior fastness and permanency. Another feature is the ease with which it may be manipulated and prepared for use. It goes thoroughly into solution and thereby gives even-sided colouration, a thing unknown with smalts and practically so with ultramarine. The tones of indanthrene do not, however, compare so favourably with ultramarine although they do not suffer by comparison with smalts. The essential factor toward obtaining the full value and purity of tone is a thoroughly washed and bleached pulp. This, of course, may almost always be presumed in the case of high grade account-book paper. The time is hardly ripe yet for a final judgment to be pronounced upon indanthrene as a substitute for the prevailing mineral blues, but there is no doubt it is a dyestuff of great promise. Perhaps those with a more extended use and experience may be able to set forth some data of substantial value to the home paper-makers.

PULP LIMITS TO BE AUCTIONED.

The Quebec Government has decided to open new districts to lumber and pulp industries and will auction off limits in the Abitibi and Lake St. John districts during the months of August and October. In the Lake St. John region the territory to be opened is north of the lake and in basin of the Mistassini and Rat Rivers. In the Abitibi it is situated south of the Transcontinental, but on the north slope in the basin which empties in James Bay. This tract is traversed by the Poisson Blanc, Harricana, and Belle rivers. Both limits have been most carefuly surveyed by the Forestry Service.

These concessions will call for the development of the water powers in the districts and will carry the obligation to construct pulp mills of a specified capacity within three years. The delay between now and August is to allow opportunity for exploration and permit of advertising the proposed auction, not only in Canada but also in the United States, Great Britain and France, as the Government wishes to attract the attention of foreign capitalists to the great natural resources of the province.

The Government has appointed five official guides to further the interests of colonization in the Abitibi district and show settlers what that district has to offer.

A MEANS TO MEASURE THE GLAZE OF PAPER

Outline of the theory and construction of the glarimeter, an instrument designed to provide a simple method of specifying the amount of glaze.

By R. L. INGERSOLL

The subject of glare from paper is one which has been attracting ever-increasing attention of late on the part of both publisher and paper maker. The demand of the reading public for a paper of less gloss, which shall cause less strain on the eyes, has already been met by a number of magazine and textbook publishers, and it is apparently only a question of time before the use of highly calendered paper will be a rarity for ordinary reading matter. This is especially probable in view of the improvements now being made in the halftone and other reproduction processes. It becomes then very desirable to be able to specify exactly the quality of any given paper as regards its glossiness or glaze—these terms being used in the present case to mean that quality of paper which gives rise to glare—and this article describes a simple instrument.

It is almost obvious that a satisfactory method for measuring glaze or glossiness must be optical rather than mechanical in character, for the smoothness of a paper is by no means a safe measure of its qualities in this respect. Following a suggestion made to the writer by Mr. J. H. Thickens, formerly of the Forest Products Laboratory of the United States Department of Agriculture at Madison, Wis., but now of the Beaver Companies, Buffalo, N.Y., to the effect that it might be possible to apply polarized light to the measurement of glaze, some experiments were performed in the Forest Products Laboratory which led to the subsequent development of the instrument about to be described.

To appreciate the principles involved, it seems well first to discuss briefly the character of the light reflected from a sheet of paper. As pointed out in numerous articles and papers by Black and Vaughn, Sweet, Luckiesh and others, one may distinguish in this connection three different types of reflection. These are: Specular reflection, as from a polished surface of metal or sheet of glass, the "angle of reflection" equalling in this case the "angle of incidence"; diffuse reflection, as from a perfect matte surface, characterized by the light being sent off almost equally in all directions from the surface, and a combination of these two which might be thought of as produced by overlaying a perfect matte surface with one or more sheets of glass.

The first type, or specular reflection, causes what is known as "glare" from the paper; that is, the brilliant directly reflected light which to a certain extent dazzles the eye of the reader, causing contraction of the pupil with consequent loss of visual acuity and resulting eye strain. The diffuse reflection gives rise to the soft, evenly illuminated appearance of a matte surfaced paper, which if used with a dead-black ink gives the combination which affords greatest ease to the eye of the reader. As a matter of fact, it is the third type which is really characteristic of the reflection from paper, as the most highly glazed paper still gives a little diffuse reflection, while even as dead a surface as that of a soft blotter shows a small amount of specularly reflected light.

It is characteristic of most glass surfaces that light reflected from them at an angle of 57.5 deg. is (almost) completely plane-polarized, and the writer found by experiment that the same is true of the specularly reflected component from paper. Pieces of glazed white paper, calendered black cardboard, calendered white paper and brown solio paper all showed at this angle a polarization of the glare component estimated at more than 99 per cent complete. This instrument, then, was designed to measure the glare by determining the fraction of the light reflected from the paper at an angle of 57.5 deg. which is polarized, the illumination falling on the paper at approximately this same angle.

It must be kept in mind that it is not the absolute brilliancy of the glare spot which is to be measured, but, rather, the fraction of the total light entering the instrument which is glare; this, in the writer's opinion, is the basis on which the matter should be discussed, as it is the relative proportion of glare and diffuse reflection which determines the readability of a given paper rather than the absolute magnitude of either.

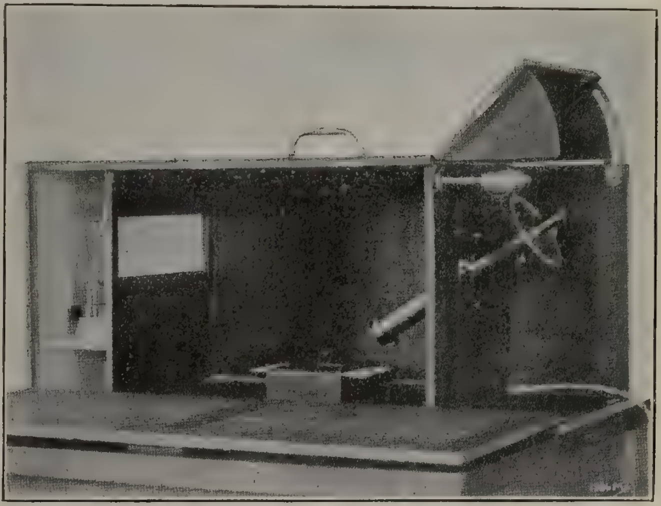


Fig. 1—Instrument Used in Measuring Glaze of Paper.

The glare, or, as it might be called, percentage glare, as measured in this way will evidently not depend on the intensity of the illumination, but it will be greatly influenced by the shape and extent of the source of light, whether it be broad or narrow, a window or an incandescent bulb. It is necessary, then, to specify some particular type of illumination to which to refer all the measurements. For use with this instrument the illumination chosen is that from a vertical opening 3 in. square whose center is at a distance of 11⅝ in. from that of the (horizontal) test piece of paper and the line from whose center makes an angle of 57.5 deg. with the perpendicular to this sheet. The opening is covered with two thicknesses of tracing cloth, behind which is placed a tungsten lamp rated at from 40 watts to 60 watts, with reflector. It must be understood that, while the selection of this arbitrary standard of illumination is highly desirable, it is not entirely necessary, for a larger (or smaller) opening would merely result in lowering (or raising) the fraction which represents the glaze of each specimen of paper and would not, in general, alter the order in the series in which any particular specimen came.

Description and Theory of Instrument.

The instrument as designed and constructed at the Forest Products Laboratory is shown in Figs. 1 and 2. Light from the window S, already described, falls on the paper at P, this being covered with a small brass frame which keeps the sample perfectly flat and exposes only about a square inch of the surface. The construction of the part A is shown in Fig. 3. The light passes first through a ¼-in. diaphragm, part of the opening of which is covered with a small Nicol ((Lippich) prism N, and the remainder with a piece of smoked glass G ("No. 2 smoked glass") which absorbs about one-half of the light[1]. The beam then passes through the eyepiece, which is another Nicol (Glan-Thompson) prism M, and thence to the eye. The prism M is mounted to rotate in adivided circle C, which reads with the aid of the vernier V to five minutes of arc.

On looking into the eyepiece one sees a divided field of view (Fig. 4), with the Nicol N below (say) and the smoked glass G above. The instrument is carefully adjusted so that N shuts off completely the specular (polarized) component of the light from the paper. A measurement is made by turning the divided circle until the two fields appear of equal brilliancy, or, in other words, until the dividing line between the two fields seems to disappear. This gives a reading which enables one at once to compute the glare.

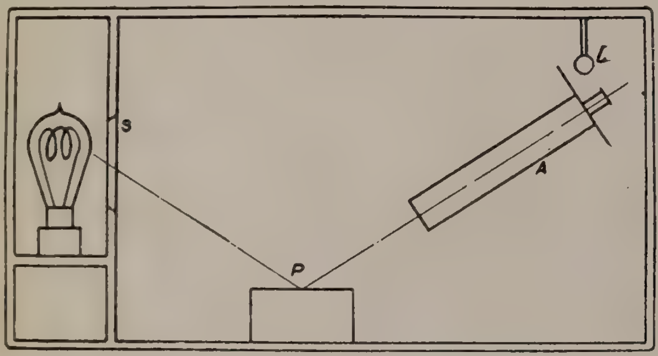


Fig. 2—Diagrammatic Section of Glarimeter.

To show how this is done it will be necessary to enter into a brief mathematical discussion of the theory of the instrument. Let x represent the fraction of the light which is plane-polarized; in short, let x represent the glare as defined above. Also, let a represent the transmission coefficient (for light polarized in its plane) of the prism N, and b the transmission coefficient for the smoked glass. Then the intensities of the two beams transmitted through this part of the instrument will be proportional to $\frac{1}{2}a\,(1-x)$ from N, and b, from G.

When these beams are viewed through the eyepiece prism M, the principal plane of which makes an angle Q, with that of N, these intensities are reduced to $\frac{1}{2}a\cos^2Q(1-x)$ and $\frac{1}{2}b(1-x)+bx\sin^2Q$, respectively.

When these two are made equal by altering the angle Q,

$$\frac{1}{2}a\cos^2Q\,(1-x) = \frac{1}{2}b\,(1-x)+bx\sin^2Q$$
$$\frac{1}{2}b\,(1+x)\sin^2Q+\frac{1}{2}b\,(1-x)\cos^2Q \qquad (1)$$

To eliminate a and b, a reading is made on unpolarized illumination (furnished by a sheet of soft blotting paper illuminated directly from above) in which case, since $x = 0$,

$$\frac{1}{2}a\cos^2Q'=\frac{1}{2}b,$$
$$\text{or } \frac{b}{a}=\cos^2Q' \qquad (2)$$

Then one may write for (1)

$$\frac{1-x}{1'+x}=\frac{\cos^2Q'\sin^2Q}{\cos^2Q-\cos^2Q'\cos Q}$$

which, after a little reduction, becomes

$$\frac{1-x}{1+x}=\frac{\tan^2Q}{\tan^2Q'} \qquad (3)$$

It appears then from equation (3) that is is possible to determine the quantity x if the two angles Q and Q' are known. As Q' may be determined once and for all and is really a constant of the instrument, this means that a determination of Q is all that is necessary, and this is measured by taking the average of a series of, say, from three to five settings with the instrument. Having determined Q, the value of x is given at once by means of a small table computed with the aid of equation (3), so the whole process of determining the glare of a particular specimen requires hardly a minute of time.

The following measurements made on some standard papers show the use of the instrument:

Paper	Per cent. Glare.
Warren Standard Warrentown Olde Style	15.1
Warren Standard Warrentown Eggshell, 70-lb.	18.3
Warren Standard Cameo Plate, white	19.3
Fine ground glass	21.4
Warren Standard Artogravure, white, 80-lb. . .	22.4
Bryant Paper Company, British opaque	38.9
Warren Standard Cumberland M. F., 70-lb. . . .	43.0
Warren Standard Library Text.	45.7
Bryant Paper Company, English Finish Mag. . .	55.8
Postal card	63.7
Glazed onion-skin, 8-lb.	66.7
Warren Standard Cumberland Super	75.4
Warren Standard Superfine	79.3
Warren Standard Lustro coated book	77.5
Warren Standard Cumberland coated book, 100 lb.	79.7
Warren Standard Printone 80-lb.	80.4
Warren Standard Superfine coated book	82.5
White glazed paper	90.5
Brown solio paper	99.2

One of the most interesting tests as that conducted on a series of sheets of unsized newspaper made at the Forest Products Laboratory, the sheets being originally identical but differing in finish by having been passed through the calendering rolls once, three times, five times, and so on, up to twenty-nine times, respectively. The measurements on this series are as follows:

Paper	Per Cent. Glare.
Uncalendered	27.7
One pinch	33.3
Three pinches	45.0
Five pinches	46.7
Seven pinches	52.8
Eleven pinches	57.0
Nineteen pinches	62.2
Twenty-nine pinches	64.8

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[1] This combination of Lippich prism with smoked glass might profitably be supplanted by a two-prism field of view with polarization planes at right angles. The present simple arrangement is so satisfactory, however, that it is not believed that the more complicated optical part would justify the additional expense.

An inspection of the results of these tests developed some striking facts. It will be noted that glazed onionskin paper showed when tested in this fashion almost the same glare as postal card, and this was so inconsistent with the results of a hasty visual inspection—which would make the glare from the onion skin far greater than that of the postal card—that a particular study was made of this case. It was found that when the onion skin was laid perfectly flat so as to avoid reflected light, the eye estimates of glaze approximated much more nearly to the indications of the instrument. The consideration of this and one or two similar cases served finally only to strengthen the confidence in the results obtained with the instrument, and to show that casual eye observations of glaze are unreliable when the papers are of widely differing texture, for example, cardboard and thin paper.

Black and colored papers give higher glare readings than do white papers of the same finish. A little thought will serve to show that this ought to be so, since the specularly reflected light is almost independent of the shade of the paper, while the diffusely reflected light is much less for the darker shades. The glare, as defined above, will accordingly be higher for the darker colors. Readings on solio paper of various shades gave measurements in illustration of this point.

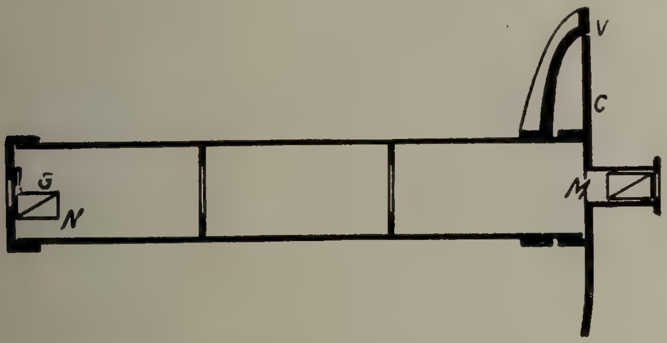


Fig. 3—Diagram showing Construction of Part A of Glarimeter

Metal surfaces, since they do not plane-polarize light by reflection, cannot be tested with this instrument. Thus, polished silver will yield almost the same readings as does a perfect matte surface. If a type of paper exists which gives what is termed "metallic reflection," it would not be possible to measure its glare in this way either; however, the writer has never seen any such paper and doubts if any such exists. The case which would be thought to approximate most closely to this, namely, brown solio paper, still gives almost perfect polarization on reflection. In view of this fact the writer feels that the indications of the instrument may be accepted with confidence for all classes of papers.

In conclusion, it is believed that this instrument will fill a rapidly growing need for some simple and exact means of specifying the glaze of paper. One does not need to analyze what a glare reading of 50 per cent with this instrument means; whether one can say that half the surface reflects as glass and the remainder as a matte surface—an erroneous conclusion, as a little thought will show—or that the surface is a mass of fine wrinkles, all of which reflect specularly but in so many directions that diffusion results. One neither needs nor is able to say exactly how this glare is produced, but one is able to state with positiveness that a paper which shows a 50 per cent glaze reading will give less glare than one of 60 per cent and, other things being equal, will be easier on the eye of the reader than the latter. The instrument will permit the printer to order a book paper of les sthan, say 40 per cent glare, and will enable the paper maker to meet this requirement with certainty; and if the net result shall be to render even the slightst service to the movement to abolish, where possible, the annoyance of glare, it will be felt that it has achieved its purpose.

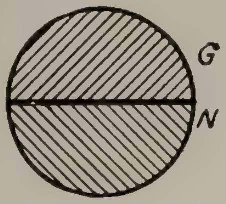


Fig. 4—Diagram illustrating Divided View on Looking in Eyepiece.

Perhaps note should be made of the fact that a patent on the instrument and method has been applied for. —Electrical World.

ABITIBI OPERATIONS.

Excavations for the foundation of the paper mill, the largest of the several buildings composing the Abitibi Pulp & Paper Company's plant at Iroquois Falls, will commence within the next few days, the mill to be ready for occupancy on June 1st, but the construction of this building will not interfere with the starting of the pulp machinery some time in May. Present plans are that the wheels will turn at the pulp mill some time in May.

The paper mill will be 500 feet in length and nearly 300 feet in width, being much larger than any of the other buildings now clustered around the edge of Iroquois Falls. It will be like the other buildings, of solid concrete construction, absolutely fireproof. Forty thousand cords of pulpwood are piled on the banks of the Abitibi and Black Rivers and tributaries waiting to be floated down the rivers to the falls when the ice leaves. It has been decided to keep a gang of 250 men at work in the bush during the summer months cutting wood on the large reserve of the company. The total now cut awaiting the spring freshets will be increased by thousands of cords of settlers' pulp, to be shipped in by rail. At the plant at Iroquois Falls 475 men are now employed, with 250 men in the bush and at the Couchiching Falls dam.

Contracts are now being signed up for the equipment of the paper mills. Contracts for the paper machines have already been signed up. These will consist of one 204-inch machine, manufactured by Walmesly, of London, England; two 188-inch and one 158-inch machine, manufactured by Pusey & Jones, of Wilmington, Delaware.

The James McLaren Co., Ltd., of Buckingham, Que., have opened an office at 1123 Broadway, New York, for the sale of ground wood pulp. Guy E. Robinson, manager of the sales department, is in charge.

Economical Operation of Paper Machines

Carelessness and neglect in the treatment of the paper machine and its spare parts may, as is well known, lead to great expenses. It is, for instance, not advisable to have only one long piece of hose lying at the side of the paper machine, as its length makes it difficult to use and it is subject to a great amount of wear by being constantly pulled backwards and forwards along the floor of the machine. There are of course such hose which are provided with a metal spiral or hemp twine spirals to protect them against the rapid wear. This however deprives the hose of its flexibility. It is much more practical to employ a number of shorter pieces of hose at various parts of the machine instead of one long length of hose. This further enables water to be given at several places at the same time, so that the cleansing of the wet-end takes place with much more rapidity and the pauses become shorter. A piece of hose should also be fixed in the neighborhood of the pulp chest so that the latter may be cleansed when necessary. If special circumstances demand the use of a long piece of hose the latter should not be allowed to lie upon the floor, but should be hung by means of hooks at the side the wet end. This not only saves the hose but removes the danger of the attendants stumbling over the same. Rubber hose should not be allowed to lie for any great length of time in one position on iron or other metal parts, as some kinds of rubber become hard and brittle at such places. It is advisable to wrap such iron or metal parts with a piece of old rubber, felt or the like in order to prevent any direct contact. Hemp hose, notwithstanding impregnation, is not serviceable on account of the wet conditions. The hose should have such a length as to allow of its being shortened once or twice at the end where it is fixed to the mains (at which place, it is well known the hose suffers most severely) without being too short.

Deckle straps are still more expensive than hose, and should be careful y protected against grease and oil. Any spots which may occur should be immediately removed with warm soda lye or benzine. Care should also be taken that the wire and the deckle strap have exactly the same speed, as otherwise the latter would wear and become rough by the friction, as a result of which the edges would lose their sharpness. The guide rolls of the deckle straps should be provided with cups to prevent all dropping of lubricating oil. The guide rolls should rotate with the least possible friction. Further, heavy deckle straps, for instance in the case of Fourdrinier cardboard machines, are best driven from the couch roll.

Wherever possible two strainers should be provided, so that in the case of one being stopped up it could be simply cut out and cleaned without having to stop the machine. In cases where papers which require exceptionally fine sorting, both strainers can be employed at the same time, the one strainer being placed somewhat higher than the other so that the pulp, after passing the first strainer, immediately enters the second, which is provided with much finer slots. The slots of the strainer should never be cleansed or scraped with pieces of sheet steel, hoop iron and the like, as the slots are widened by this process. Soft bronze wire or stiff sea grass brushes are most suitable for this purpose. On the inside the slots should be cleansed by means of a flat piece of medium-hard wood cut to a sharp edge on one side; with this the slots are rubbed backwards and forwards, whereby the thin piece of wood pushes the knots over to the other side, where they can be easily brushed off. Flat strainers should be so erected that they can be easily raised into a perpendicular position. It is for instance possible to erect a winch on the outside of the pulp chest, and connect the same up to the frame of the strainer which is to be cleaned, by means of a wire rope. This device works much quicker and is much safer than lifting the heavy frame up by hand.

Froth blisters are a frequent cause of breaks in the paper. The formation of froth often takes place as a result of the back water from the wire, containing a concentration of froth-forming stuffs, being repeatedly employed, and sometimes as a result of the stuff having too great a drop from the pulp chest to the wire. To remove the froth before the gate a shower pipe should be fitted pointing almost vertically upwards so that the falling drops destroy the foam.

For removing wrinkles the tender should have an ample supply of strips of paper or mull-muslin of various widths always at hand. Strips of felt or old pieces of belting should also always be kept in readiness in order to be able to regulate the tension between the various parts of the machine at any moment. For fixing these strips on to the belt pulley a mixture of 50 parts of molten resin and 50 parts of drip oil, which should also always be kept in readiness, in use, has been found to give excellent results. The latter points will probably appear superfluous to some paper makers but the observation of the same will tend to save many kilograms of waste paper.—Der Papier Fabrikant.

Properties of Straw Pulp

A writer in the Wochenblatt, who has had much experience in the manufacture of straw pulp, has observed that the pulp frequently turns out extremely "greasy" in working, sometimes less so, and occasionally quite "free." He attributes these variations principally to the constitution of the raw material. Wheat straw nearly always gives a more "greasy" pulp than rye straw. These differences are frequently still more increased by the nature of the soil and the manner of manuring. Many artificial manures, especially phosphates, influence the boiling and bleaching as well as the quality of the pulp. The straw also varies in different years, and in one year the yield of pulp may be considerably less than in another year, also more "greasy" in working. Straw grown on soil heavily manured with phosphates gives a lower yield than straw from soils treated with natural manure. Of course wheat straw must be boiled differently from rye straw, and it is desirable also that straw grown on different soils be treated in correspondingly different conditions if the origin of the material be known. As it happens, the results tend to show considerable variations both in ease of bleaching and in behaviour on beating. Beating is generally performed in refiners, and if the stuff is not boiled sufficiently soft, it is necessary to beat more heavily, and the refiner stones require sharpening more frequently in order to obtain clean stuff. All these circumstances lead to a more "greasy" pulp. The hardness and fineness of grain of the refiner stones naturally exert a great influence on the condition of the stuff, and the writer has obtained the best results with a refiner having a lava running-stone and a sandstone fixed stone. Wheat straw as a rule is boiled and bleached less easily than rye straw, and the pulp from rye straw is nearly always "freer" in working and generally whiter in colour. Wheat straw pulp shows a tendency to roll up into balls in the hollanders and chests, which is a sign that the material has been too strongly boiled. On the other hand, if it is not sufficiently boiled the stuff is hard, not easily bleached, and requires heavier milling. "Free" stuff can be made slightly more "greasy" by suitable treatment in the hollander, but no considerable change in the character of the stuff can be effected at this stage. Straw pulp, on account of its high white colour and cleanliness, is very well suited as a component of the finest grades of papers, particularly post papers. It imparts great hardness, rattle and a fine clear look through. A large addition of straw pulp is very useful if it is desired to increase the tensile stretch of the paper. Other advantages are that it is easily sized, and carries loading particularly well.—The World's Paper Trade Review.

Safety First

This grand scheme for protection and saving of human life is undoubtedly well known to the readers of this magazine, not only from a previous article, but also from articles in other trade papers and in the daily press.

In this we only desire to give a few practical hints which may be a help to men in the pulp and paper line, anxious to see this movement organized at their mills, and who are doubtful how this should best be accomplished.

The movement must first of all have the full approval of the management.

A committee should be appointed consisting preferably of:—

1a—An independent, practical man as chairman.
2a—One or more representatives of the company.
3a—Superintendents or foremen in charge of departments or outdoor and construction gangs.
4a—Two or more representatives selected amongst the different crews.

This committee should make thorough investigations monthly, or oftener if considered necessary, investigating everything and every place inside as well as outside the mills, where accidents are likely to occur.

When new construction is going on, one man of the committee may be appointed to make daily investigations and to report to the committee, as this kind of work is usually the chief source of injury to the employees.

Brief reports should be submitted to the management, giving details of proposed improvements and reasons therefore, and now fulfillment of promised improvements, inside reasonable time, should be reported as well.

In the north European countries, where there is strict Government inspection to guard the safety of the industrial employees, the very largest industrial companies have themselves taken up the "Safety first" movement and based the same on the above principles.

They are satisfied that this movement has not only saved them a considerable amount of money, but has also brought them the best of the skilled men in the line, and other companies have found it necessary to follow their example.

There is no doubt that the manufacturing companies here in Canada, who have to take a larger responsibility for accidents occurring in their mills and factories than companies in most other countries, and where the inspection is negligible, would derive great benefits from joining the "Safety first" movement.

The expenditure for safeguarding the employees, suggested by a "Safety first" committee will prove small compared with the sums the company will otherwise most likely have to pay to employees injured or cripples, when these are not insured by the company, and there is no doubt that a general adoption of the "Safety first" policy will in time bring down the premiums for accident insurance, collective as well as personal, which are very much higher here than in Europe.

Many a good employee is also lost because he considers the conditions he works under too dangerous.

In whatever relation you stand to the industry, investigate this question carefully and you will find that it is to your benefit to join this movement.

More than that, human lives are too valuable to be wasted, especially in a sparingly populated country like ours.

Wrapping Paper Div. A.P.P.A. Meeting

(Special to the Pulp and Paper Magazine.)

Chicago, Ill.

The wrapping paper division of the American Paper & Pulp Association held an Executive Meeting at the Congress Hotel in this City this morning, and several interesting matters were discussed. Frank L. Moore, of Watertown, N. Y., was in charge of the session, and Arthur C. Hastings, President of the American Paper & Pulp Association, was present.

Two definite results of the meeting may be enumerated. One is that the wrapping paper division may be expected to stand firmly by the parent organization and work co-operatively for the success of the organization. The other is the awakening of a deep interest in organization plans among the paper manufacturers of the west. There were approximately thirty paper manufacturers in the wrapping paper branch of the business represented at the gathering and two-thirds of this number represented the west. There were many representatives of Wisconsin and Michigan mills.

Following the meeting of the wrapping paper division, there was an informal executive session of those members of the executive council of the American Paper & Pulp Association who were in the city. No definite announcement of the proceedings of this meeting was given out, further than that the work of the wrapping paper division earlier in the same day was considered and received in good spirit.

The question of the advantages of organization at once came up for discussion. There were several speakers who made interesting addresses on the subject. The manufacturers were in harmony with the idea of strong organization and were led to realize the advantages to be gained, in the face of serious questions that must be faced from time to time.

Steps of organization were perfected, and it was determined that permanent quarters, in charge of a permanent secretary, should be maintained.

The meeting elected Mr. Moore as Chairman of the wrapping paper division and selected an advisory council as follows:

L. M. Alexander, Nekoosa-Edwards Paper Company, Nekoosa, Wis.

George C. Bayless, Bayless Paper & Pulp Company, Austin, Pa.

M. E. Marcuse, Bedford Pulp & Paper Company, Richmond, Va.

George E. Crafts, Orono Paper & Pulp Company, Bangor, Me.

Allen M. Fletcher, Fletcher Paper Company, Alpino, Mich.

At the conclusion of the meeting Mr. Moore discussed the steps taken with the correspondent of The Pulp and Paper Magazine, in which he said:

"We accomplished the purpose of the meeting. There is every indication now that the wrapping paper division will be a strong division of the American Paper & Pulp Association. The manufacturers who attended were enthusiastic on the subject of organization. The western manufacturers now are thoroughly interested. Heretofore there has not been a great effort devoted to the enlargement of the organization but this work will be prosecuted to the utmost in the future. We will have permanent headquarters, in all probability in connection with the headquarters of the American Paper & Pulp Association in New York."

Mr. Moore concluded by saying that there is every indication that the wrapping paper division will stand strongly with the parent organization, and Arthur C. Hastings, the president of the latter, appeared very pleased with the results of the gatherings of the several divisions. He expressed himself strongly in favor of co-operation in organization. To your correspondent, he said in part:

"The purpose to-day was to effect a good working organization of the wrapping paper division. The work to be done is such that the parent association can not well handle the work of each division; therefore it is better to have each division closely organized within itself. On the other hand it is essential that each division stand strongly behind the parent body and such co-operation is assured by the sentiment expressed to-day."

President Hastings said it has become necessary to the welfare of the paper manufacturers to stand shoulder to shoulder in their respective divisions because of the ever present problems with which the manufacturers are confronted, both at the instance of the government and otherwise. The executive of the association said the meeting of the executive council members was merely informal and did not constitute a meeting of the council, as only a part of the membership was present. Besides the wrapping paper division, there were represented the news and writing paper divisions.

MILLIONAIRE LUMBERMAN DEAD.

Frederick Weyerhauser, the multimillionaire lumberman of St. Paul, Minn., died at Pasadena, Cal., on April 4. He was 79 years old. He was stricken with a severe cold and symptoms developed which caused his death. He had been spending the winter at his winter home at Oak Knoll.

U.S. Treasury Drops Appeal in Importers' Case

Will Make Refunds of Duty Paid on Imports of Pulp and Paper From Canada.

The Board of United States General Appraisers has begun deciding a large number of importers' protests relating to wood pulp and paper produced and manufactured in Canada, and which are claimed free of duty under the terms of the Canadian Reciprocity Treaty. The test issue, standing in the name of the American Express Company, and F. Bertuch, was decided favorably to the importers by the United States Court of Customs Appeals last May. The Treasury Department, however, demurred to paying to the importers refunds involved in the issue, estimated to-day by Albert H. Washburn of Comstock, and Washburn, counsel for the protestants in the test case, to amount to $1,000,000 or more, and at the same time, instructed Assistant Attorney-General Wemple to ask the board not to decide the hundreds of protests raising a similar question filed with the lower customs tribunal. The board acquiesced in the request, pending action by the department.

The Treasury authorities announced that they proposed introducing a bill into Congress to give the Supreme Court the right to pass upon questions raising constitutional and treaty issues after decision by the customs court. It was planned to have the Supreme Court pass upon the pulp and paper cases in the hope of securing a reversal of the lower court's decision. While the bill has been introduced and is under consideration by the Judiciary Committee for the House of Representatives, Mr. Wemple informed its members at the recent hearing in Washington that the Treasury Department had decided not to prosecute an appeal in these cases to the Supreme Court in the event of the present bill becoming law. This decision having been communicated to the Board, the latter tribunal is now expected to act vigorously and dispose of the great accumulation of cases favorably to the importers and in harmony with the findings of the Customs Court.

It is assumed here that the treasury department is now prepared to make the heavy refunds to importers as fast as the protests are decided by the Board and re-liquidation by the customs authorities.

RIORDON DIRECTORS RE-ELECTED.

At the annual meeting of the Riordon Pulp and Paper Company held in Montreal on April 1st, retiring officers and directors were re-elected as follows: Charles Riordon, President; Carl Riordon, vice-president; Charles E. Reed, secretary-treasurer; J. G. Riordon, F. W. Avery, Walter G. Whitte, W. J. Douglas. At a special meeting of the stockholders held after the regular annual meeting the by-laws of the company were amended so as to enlarge the company's borrowing powers.

The Tariff Changes

The principal changes effected by the new tariff schedule submitted by the Finance Minister are as follows:

Item 379.—Rolled iron or steel angles, beams, channels and other rolled shapes and sections of iron or steel not punched or drilled or otherwise further manufactured, weighing over 120 pounds per lineal yard N.O.P., not square, flat, oval or round shapes, and not being railway bars or rails, changed from $2, $2.75 and $3 to $2, $3, and $3 per ton under British preferential intermediate and general tariffs respectively.

New item, 39C.—Cassava flour, when used in the manufacture of explosives, is made free under all tariffs.

New item, 99 A.—Dried or evaporated bananas, per pound, are made free, and ½ cent under general and intermediate tariffs.

113.—Cocoanut, sweetened or not, per pound, made 3 cents, 4 cents, and 4 cents, instead of 5 cents.

New item, 17A.—Alcohol, or refined fusil oil, imported under license from the Inland Revenue Department, to be denatured for use in the manufacture of metal varnishes or lacquer, is made free.

184.—Item regarding duty on newspapers and magazines and weekly literary papers unbound, and fashion plates, is amended by adding the words "when imported in single copies in sheet form with magazines or periodical trade journals, these being free.

New item, 208 A.—Chloride of lime and hypo-chloride of lime in packages not less than 25 pounds transferred from the free list and made dutiable at ten cents and fifteen cents per hunded pounds; when in packages of less than 25 pounds, 17½ per cent, 25 per cent, and 25 per cent, instead of free.

210 A.—Caustic soda in packages not less than 25 pounds changed from free to 1-5 cents and 3-10 cents; when in packages less than 25 pounds the duty is 17½ per cent and 25 per cent.

296.—Talc, which was formerly free, is put in the enumerated list, and thus made dutiable at 15 per cent, 17½ per cent and 20 per cent.

306 A and 306 B (new item).—Building stone sawn on four sides is made dutiable at fifteen cents per 100 pounds, and when further manufactured, at 45 cents per 100 pounds, instead of 20 cents.

New item, 315 A.—Carbon electrodes of over 35 inches circumference changed from three to twenty per cent.

New item, 327 A.—Silvered lenses, rate reduced from 30 per cent to 15 per cent.

353 A.—Aluminum leaf reduced from 27½ per cent to free.

375 A.—Ferrosilicon made $4.50 a ton, instead of $2.50.

378.—Galvanized hoop steel changed from 30 per cent to $7 per ton.

386.—Wrought or seamless iron or steel tubing, from four to ten inches in diameter, changed from 10, 12½ and 15 per cent to 20 and 30 per cent.

New item, 398 A.—Wrought or seamless iron or steel tubing over ten inches in diameter changed from 10 and 15 per cent to 10 per cent.

410—Coil chain and links under 1⅛ inches, changed from 5, 7½ and 10 per cent to 15, 20 and 20 per cent.

411. — Malleable sprockets, chain or link belting, chain made free when used in agricultural implements, whereas it was formerly free for all purposes.

445.—Mowing machines, harvesters, self-binders and reapers changed from 12½, 15½ and 17½ per cent to 12½ per cent on all three tariffs.

445 A.—Malleable castings for implements, mentioned in 445, are retained at 15, 17½ and 17½ per cent.

446 A.—Parts for traction ditching machines, formerly dutiable, made free.

453 A.—Electric dental engines changed from free to 15, 17½ and 27½ per cent.

471.—Round rolled wire rods in the coil of iron or steel, not over 3-8 of an inch diameter, changed from free to $2.25, $3.50 and $3.50 per ton; when imported to manufacture wire in the coil, for use in the manufacture of chain changed from free to $2.25, $3.50 and $3.50.

478 A.—Iron and steel sections for saddlery hardware placed on the free list, where formerly they paid a general tariff of $7 per ton.

495 R.—Cork slabs, boards, planks and tiles, produced from cork waste or ground cork, changed from 15, 17½ and 20 per cent to 20, 30 and 30 per cent.

533 A.—Garnetted wool waste in the white, transferred to the free list instead of being dutiable at 7½, 10 and 12½ per cent.

542.—Jute or hemp yarn, plain, dyed or colored, use limited to prevent free importation of twine.

548 A.—Paper twine for furniture changed from 20, 22½ and 25 per cent to free list.

575.—Tape lines are given a uniform duty of 25 per cent, 33½ per cent, and 35 per cent, where formerly there were several rates of duty.

605.—Buttons of vegetable ivory, changed from 22½ per cent, 30 per cent and 35 per cent to five per cent per gross, plus twenty per cent.

671 A.—Parts of corset clasps and wires, transferred to the free list where formerly dutiable in the general tariff at 3 per cent.

692.—To allow foreign governments to make presents for saving human life without duty being charged for same.

Provisions for Drawbacks.

The provisions for drawbacks were announced as follows:

1017.—Lap welded tubing of iron or steel not less than four inch diameter and used in casing weld or for natural gas transmission fifty per cent.

1019.—Bituminous coal, drawback of 99 per cent of duty extended to coke ovens, other than those owned by smelting works when intended for smelting and melting ores.

1021.—Wire rods used for the manufacture of fencing wire, 9, 12 and 13 gauge, 99 per cent of duty.

1022.—Charcoal used for smelting of ores, 99 per cent.

1023.—Rolled hexagon, iron or steel bars used in the manufacture of cold drawn or cold rolled iron or steel bars or turned and polished shafting, 99 per cent.

1024.—Yarn composed chiefly of wool, No. 30 and finer, in white when used in the manufacture of socks and stockings 99 per cent.

Under section 1212.—Aigrette, aigrette plumes, ostrich plumes and the skin or plumage of wild birds are prohibited for importation, but this does not apply to ostrich feathers, English pheasant and Indian peacock, the plumage of game birds or birds imported alive, or to specimens for museums or educational purposes. The prohibition will become effective on January 1, 1915.

UNITED STATES NOTES

Conferences regarding the wage scale for the workmen of all trades at all the plants of the International Paper Company were held at the Boston headqurters office of the company last week with satisfactory results. Four International Union presidents with committees from the 25 plants of the company were present.

* * * *

International Paper Company of 30 Broad Street, New York, has declared its regular quarterly dividend of ½ of 1 per cent. on preferred stock payable April 15. Books of the company closed on April 1.

* * * *

The Economic Power and Products Company has been incorporated in Delaware, for the manufacture of paper from cotton stalks. The Company is being financed in Philadelphia, Pa. The officers, all Philadelphians, as shown by the prospectus, are: President, James M. Dyan; vice-president, General James B. Coryell and Elbert A. Corbin; secretary and treasury, William D. Miller. The company estimates that with the stalks from Southern cotton fields it can produce each year a quantity of paper that if made from wood pulp, would mean the deforestization of 800,000 acres of timber land.

* * * *

In line with retrenchment policy the Pennsylvania railroad has issued orders cutting out the paper roller towels. That they are sanitary is not denied but the new style of towel has proven rather expensive. It may take some time before the paper towels entirely disappear as there is a large stock on hand, but in many of the local offices the linen towel has again made its appearance and the roller towels have been discarded. On some of the trains the paper towels will continue until the supply is exhausted. The officials have figured out that it is much cheaper to provide individual towels for their clerks and in each department cupboards are now being provided for individual towels. Arrangements will be made to have these towels laundered at the company laundries in New York, Philadelphia and Pittsburgh. Each employe will probably be allowed an average of four clean towels each week.

* * * *

Assurances have been given to Second Vice-Presi- Union, Business Agent Thomas Murphy of Eagle Lodge dent W. C. Smith of the International Paper Makers' and a delegation of members of Eagle lodge from each of the mills of the American Writing Paper Company, at Holyoke, Mass., and vicinity by the officials of the company that the three tour system would be inaugurated in all the divisions of the company as soon as possible. Trade conditions prevented doing this immediately but it will come, promised the officials of the company.

* * * *

Rumors that a contest for control will be waged at the annual meeting of the Union Bag and Paper Co. have been started in New York Circles by the request for proxies by the shareholders' committee as well as the management. A member of the stockholders' committee says, however, that the committee and management are working in harmony and that the former has asked for proxies in conformity with its custom of former years. He added that it made no difference whether stockholders forwarded their proxies to the company or the committee.

* * * *

Great Northern Paper Company distributed 10 per cent. in dividends in 1913, says the Lewiston, Me., Journal in discussing the paper market, and indications are this record will be duplicated in the current year. This company has the unique record of operating capacity continuously throughout the year. Through control of its sources of water supply, it is able to secure an adequate supply of water for power and paper making when mills in other parts of the country have shut down on account of drouth. The company's rated capacity daily. This may be increased during 1914 by the addition of a new machine to 600 tons daily. While the price of paper is lower than 1913, there is more "stability to the newsprint market," and this element is an important factor in shaping net profits. Just what the word "stability" signifies we shall know later. Meantime it is probable that International Paper Company will soon be able to get logs free of export duty from its valuable crown lands. Will there yet be an international concert in paper as there is in some other products? Such concert is possible. There are many ways of misconcert until the soft pedal is in ocular demonstration. Ten per cent. net is pretty fair for a Mellon year.

* * * *

The cases of the Williamette Pulp & Paper Company of Oregon and the Western Co-operative Company against Clatsop County have been settled out of court. These actions were on an appeal from the ruling of the County Board of Equalization and were brought to set aside the assessed valuation fixed upon the plaintiff's timber lands. The settlement was effected as a result of the second cruise made of the timber. A similar suit brought by the Crossett Timber Company against the county is also reported to have been adjusted.

* * * *

The American Writing Paper Company has adopted a new and novel method by which it is expected many improvements will result in its various mills which will help to bring the business of the company up to the highest point of efficiency. The plan is to have the superintendents and managers of the different mills visit the various plants and suggest any changes that they may think will be of benefit to the many different departments. Schedules of these "suggestion tours" have just been sent out to the mill superintendents and managers. These schedules are so arranged that the superintendent of a mill will not be a member of the same group, as the manager of the same. They will go in parties of five or six, and will probably make weekly trips. These trips will continue until every mill is inspected. On these trips the superintendents and managers will be expected, it is said, to make careful inspections of everything that comes under their observation. It is thought that some managers and superintendents will have certain ways of doing this or that kind of work that may not be in use in other mills and that by calling the attention of the other mill officials to these things, the company is certain to be the gainer.

The paper mill strike at Marinette, Wis., is over. The men returned to work last week and everything is moving nicely in the three paper mills there. The strike lasted less than two days. The men state that they were granted a raise of twenty cents a day at a conference between a committee of six appointed by the strikers and Gen. Mgr. Hoskins a compromise was arranged and later it was submitted to the employes at a mass meeting. The compromise was unanimously accepted and the night crew immediately left to resume work.

* * * *

As a result of the visit of the officials of the Union Bag & Paper Co. to Kaukauna, Wis., last week it has been decided that extensive improvements will be made to the mill there this year, involving the expenditure of upwards of $50,000. . A. Kimberly, Jr., vice-president of the company, C. B. Sanders, manager of factories, both of New York, accompanied by Thos. Getsham and T. M. Avery, special construction engineers, inspected the Kaukauna plant and at a business meeting held later in Chicago it was decided that the needed improvements be made and the construction experts are now busy preparing plans. The improvements will include a complete rebuilding of the flume beneath the mill, which will be laid in concrete and steel. New reinforced concrete floors will also replace the old wooden floors in various sections of the plant which have become badly rotted from age. The improvements to the flume and floors will be after the style of the recent reconstruction of the Thilmany flume, and will be built for future endurance.

* * * *

The fire loss occasioned by the burning of the paper mill of the Bedford Pulp and Paper Company, at Big Island, Va., last month has been adjusted and the company is now considering the question of rebuilding. It has not been determined yet whether the mill will be located at the old site or elsewhere. To locate the mill elsewhere would kill Big Island as a town for practically its entire population has lived from the mills pay roll for years.

* * * *

Fire which broke out in the woodroom of the Dells, Paper and Pulp Co. mill at Eau Claire, Wis., several weeks ago resulted in a loss estimated at $2,000. Most of this was to machinery. The cause is not known but it is thought to have started either from friction in one of the belts or from the electric wires. The automatic springlers started work at once and if it had not been for them the fire would have gained a dangerous lead. The building was not so badly damaged but what it can be used, but there will be a little delay to repair the machinery.

* * * *

Using as its slogan, "A new name but the same policies," the Taylor Burt Co., papermakers of Holyoke, Mass., has been reorganized as the Taylor-Logan Co., with Hon. James Logan, ex-mayor of Worcester, Mass. as a large stockholder and a director. Mr. Burt who was with the company at its beginning in 1905 sold out his interests and retired from the company in 1909. Mr. Logan has been a stockholder for a long time, and last year increased his holdings and consented to become a director. It was in recognition of this, according to a statement from the company, and of the help that the ex-mayor's support and council brought that the name of the company was changed. The Taylor-Logan paper and especially the brand known as "Public Service Bond," is sold all over the United States and Canada. The company owns valuable land, water power rights and a modern, well-equipped plant at Holyoke, and it manufactures high-grade bond papers cover for adverpetus of Mr. Logan, the company will increase the size of its plant, and thereby extend its territory and increase its output.

* * * *

Word has just been received at Madison, Maine, from Boston that increased wages will be paid all employees of the Great Northern Paper Co., at its plants in Millinocket, East Millinocket and Madison, by an agreement reached by the company and union leaders. The agreement which is for two years followed four days of conference. The minimum rate of wages is advanced in every department. On May 1, a further increase will be made, as a result of which, 250 papermakers will receive an advance of 11 per cent.; 800 pulp and sulphite workers will receive 7½ per cent additional, and 250 engineers, firemen and mechanics will obtain increases amounting to an average of 10 per cent. In some instances, the increases amount to 20 per cent. The agreement provides for the six-day week, the eight-hour day for the papermakers, a nine-hour day for the pulp and sulphite workers and others; observance of jurisdiction as laid down by the A. F. of L. Laws; that there shall be no strikes or lockouts, and arbitration to adjust any disputes. The agreement is signed by General Manager W. A. Whitcomb for the company, International President J. D. Carey of the Papermakers, John H. Malin of the Pulp and Sulphite Workers and Timothy Healy of the Firemen's Union; New England Organizer Frank H. McCarthy, representing the Federated Trades Councils of Millinocket and Madison; John T. Mackin and W. P. Garin of the Millinocket Pulp Workers, Thomas Powers for the Millinocket workers, William F. Jones and George F. McCann for the Millinocket Pulp Workers' Union, Henry Capen for the Millinocket Firemen's Union and William A. Brown and John F. McDonald for the East Millinocket Federated Trades Council.

HOW TO DETECT SIZING.

Kollmann has made various attempts to detect rosin and animal size microscopically in paper. The behaviour of rosin and papers sized with animal size in the presence of the following reagents was tested: iodine solution, concentrated nitric acid, nitrate of mercury, potash lye and sulphate of copper (Biuret reaction), glacial acetic acid and concentrated sulphuric acid (Adamkiewicz), tannin solution, concentrated sulphuric acid and sugar (Raspail's action). Only Raspail's reaction and the tannin reaction were found useful, the presence of fat and casein in the paper being a condition.

Raspail's reaction for detecting rosin size. The paper is moistened on the object carrier with a concentrated solution of cane sugar, torn into fibres and the solution pressed away with filter paper; concentrated sulphuric acid is then dabbed on. Under the microscope the material then looks distinctly red if the paper was rosin sized.

Tannin reaction for detecting animal size. The paper is heated with water on the object carrier, the paper is removed and tannin solution added to the extract. If the paper was animal sized then a brownish amorphous precipitate is seen through the microscope. —Der Papier-Fabrikant.

NEW PATENTS

PULP-REDUCING APPARATUS.

By CHARLES WELLS SHARTLE, of Middletown, Ohio.

U.S. PATENT NO. 1,091,941.

This invention pertains to a system of apparatus so organized that the screening machine may run with practical continuity, notwithstanding the fact that the rough pulp tailed away from the screening machine may require to be acted upon by reducing machinery working in a discontinuous manner.

My present invention will be readily understood from the following description taken in connection with the accompanying drawings in which:—

Figure 1. is a plan of a pulp-reducing apparatus exemplifying my invention, and Fig 2 is a vertical longitudinal section of the same in the plane of line a of Fig 1.

In the drawings:—1, indicates a pulp-screening machine of usual type; 2, the outlet therefrom for the pulp which is of such degree of fineness as to have passed through the screen-plates; 3, the head of the screen, onto which is to be delivered, by any suitable means, the rough pulp of such degree of wetness as is suitable for the screening operation; 4, the tail of the screen, onto which is to pass the rough pulp which is of such coarseness as to be unable to pass through the screen-plates; 5, an endless series of drag-blades of known construction arranged to drag the pulp over the screen-plates from the head to the tail of the screen; 6, a beating engine of known type, adapted to receive the rough pulp tailed off from the screen and, by operating upon that pulp after a proper length of time, to reduce it to proper degree of fineness, this beating engine being adapted to receive the tailings from the screen, the illustration showing the beating engine as being located upon a lower level than the screen, as on a lower floor of a mill, so that the tailings from the screen may flow to the beating engine by gravity; 7, a discharge pipe through which the beating engine may be emptied of its contents; 8, a gate in this discharge pipe; 9, a water supply pipe to deliver into the beating engine such water as may be needed in the pulp therein to fit it for proper action by the beating engine; 10, a chute adapted to deliver the tailings of the screen to the beating engine where gravity is depended upon to effect the delivery, as in the particular case illustrated; 11, a trap door in the tail of the screen between the terminal end of the screen and the terminal end of screen tail 4, this trap door being preferably located very near the terminal end of the screen; 12, a tank disposed between trap door 11 and the beating engine and having preferably a volume considerably in excess of that of the beating engine; and 13, a valve disposed at the base of the tank and adapted to permit the discharge of the contents of the tank or a portion thereof into the beating engine.

In the operation of the apparatus, in the particular form illustrated, the rough pulp, of proper wetness, goes onto the head of the screen and is dragged over the same by the drag-blades. Pulp of proper fineness passes through the screen-plates and out through the outlet 2, for utilization or for further treatment if need be. Trap door 11 being closed, the drag-blades drag tailward, the pulp too coarse to pass through the screen-plates, this coarse stuff passing off of the tail and thence into the beating engine through chute 10. As the pulp, in passing over the screen has not only parted with much of the finely reduced pulp, but also a large quantity of the water carried by the pulp delivered to the screen, the pulp delivered to the beating engine is not sufficiently wet for beating operation. To make up for this deficiency a proper amount of water is admitted to the beating engine through supply pipe 9 and the described operation is continued until the beating engine is properly filled, it being understood, of course, that the beating engine is in motion and exercising its reducing function upon the pulp while the pulp is being delivered into it.

The beating engine having been properly filled with pulp and properly supplied with water, trap door 11 is to be opened, whereas the pulp tailed from the screen, goes into tank 13 instead of into the beating engine, it being understood that valve 13 is closed. The beating engine operates upon the pulp within it until the same is reduced to the proper degree of fineness whereupon gate 8 is to be opened, and the reduced pulp discharged through pipe 7 to some proper point for utilization or for further treatment if need be. In the meantime the screen has been tailing into the tank, and when the beating engine has been emptied and gate 8 again closed, then valve 13 is to be opened and the contents of the tank or a sufficient quantity of the contents go into the beating engine to be acted upon by it in the same manner as it acted upon the tailings received by it directly from the screen. If there is a sufficient quantity of pulp within the tank to properly fill the beating engine then, after the transfer, valve 13 may be closed and the tailings from the screen may continue to go to the tank through the trap door. If there be an insufficient quantity of pulp in the tank to properly fill the beating engine then the quantity in the beating engine may be added to by tailings passing through the trap door and through the tank or, the trap door being closed, by tailings going to the beating engine through chute 10, or, in case of an insufficiency,

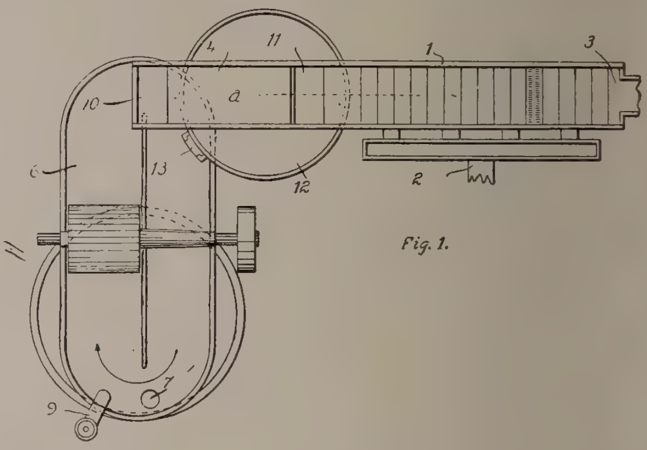
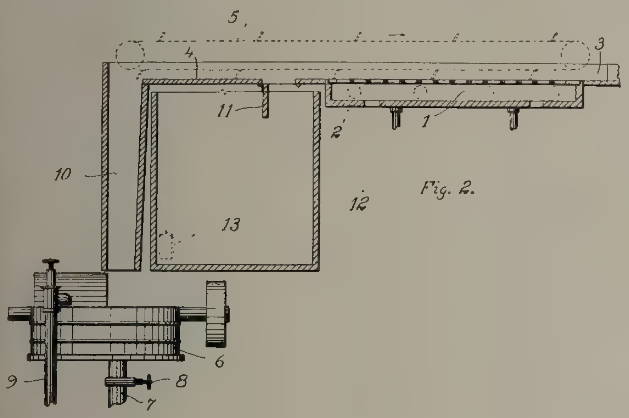


Fig. 1.

of pulp in the tank, the trap door may be closed and the beating engine may receive pulp simultaneously from the tank and from chute 10.

It will be apparent from the foregoing description that my invention consists in interposing between the screen and the beating engine or reducing mechanism a storage receptacle and in providing means for interrupting the discharge of the screen directly to the beating engine and causing the same to discharge into said storage receptacle, and further providing the storage receptacle with means for causing the desired portion of its contents to be discharged into the beating receptacle, thus enabling the screen to be operated continuously regardless of the amount of material being fed over the same. If there is but a small amount of waste or coarse material being discharged from the screen, which can be taken care of by the beating engine, the screen is allowed to discharge directly to the beating engine. However, if the amount of coarse material is such as to exceed the capacity of the beating engine it is discharged into the storage receptacle and thence into the beating engine when the latter is ready to receive it. In this mannr the screen operates continuously and where the amount of coarse material is sufficient the beating engine can operate at its full capacity practically continuously because as soon as it has been emptied it can immediately be refilled from the storage receptacle without waiting for the slower process of filling it directly from the screen.



I wish it to be understood that I do not desire to be limited to the details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

ROTARY SUCTION-ROLL OR VACUUM COUCH-ROLL FOR USE IN PAPER-MAKING MACHINES.

By **ROBERT MARX**, of London, England.

U.S. PATENT NO. 1,091,899.

This invention relates to improvements in or applicable to rotary suction rolls or vacuum couch rolls for use in paper making machines.

An object of the invention is to mount a stationary suction box having an open top within a perforated drum or cylinder in such a way that said box is immovable radially of said cylinder and nevertheless an effective airtight joint is afforded between the interior of said cylinder and the edges bounding said open top.

Further objects are to provide antifriction bearings if desired of a more or less fluid tight nature between said drum and said box, to improve the construction and arrangement of members which produce said airtight joint between said drum and suction box, and generally to provide an apparatus in which the suction box is prevented from being drawn against the drum so that any wear comes upon the jointmaking members and is distributed over a considerable area, the result being that less driving power is required, the vacuum is more efficiently maintained, the wear parts are renewable in a simple manner and at low cost, and the power consumption by the pumps and the machine is considerably reduced.

In the drawings, Fig 1 is a central longitudinal section of an improved suction roll machine. Fig. 2 is a transverse section. Fig. 3 is a longitudinal sectional view of a bearing detail to a larger scale. Fig. 4 is a more or less diagrammatic plan view of the arrangement of packing members. Fig. 5 is partly an end elevation and partly a transverse section of one end packing member and its holder. Fig. 6 is a section at right angles to the section in Fig. 5 and Fig. 7 is a plan section taken on the line VII—VIII of Fig. 5.

Referring to the drawings, a, are suitable standards or supports, and fixedly connected thereto, are hollow trunnions b, which form extensions of the central suction box c.

d is a rotary drum mounted on the trunnions b in the manner hereinafter described.

The suction box c is provided with an aperture e which communicates with the suction chamber proper, and f is a suction connection at the end of one of the hollow trunnions b for exhausting the air from the suction chamber through the suction box. The ends of the hollow trunnions are hermetically sealed by disks g, and these trunnions may be fixed in the supports by means of the set screws h, so as to permit the adjustment of the suction box to meet the various requirements. The sides of the suction box are formed by a plurality of longitudinally extending bars which are seated in chambers m, as clearly shown in Fig. 2. These bars may be made in one piece, but I prefer to form them of a plurality of pieces, as illustrated in the drawings. Each of these members comprises the upper strip, j, which is arranged to engage the inner periphery of the drum, and which is secured to a ram b', so that the entire bar is moveable in a vertical direction in the chamber m to hold the upper face thereof in contact with the inner periphery of the drum. The end members extend from bar to bar, and from the bottom of the suction chamber to a point adjacent to the inner periphery of the drum. Each of these end members comprises a holder p the full width of the suction chamber, and which is provided with a transverse groove, as clearly shown in Fig 7. Moveably mounted in this groove is a slider v, which is normally held in its upward position by means of a plurality of springs w, seated in openings in the bottom of the holder, which bear against the bottom of the groove in the holder. Seated within this groove above the slider v, is a packing member k, which extends from side bar to side bar, and is held in contact with the inner periphery of the drum d by means of the spring w, which holds the slider in its elevated position. These packing strips k may be of inverted U-shape in cross section, the limbs of the U extending downwardly and rest on the slider v in the groove in the holder p.

Connected to the lower end of each of the end members, is a longitudinally extending leather packing, which is arranged to form a tight joint between the sides of the chamber m and the members forming the sides of the box. Water under pressure is admitted to the spaces beneath these packing members o through a pipe n to hold the side members in their elevated position.

It will readily be understood from the foregoing description that the side members engage the end members throughout the entire height of the side members, which will avoid any leakage between the side and end members. The packing strips k prevent leakage between the end members and the inner periphery of the drum, and as the side members are held in contact with the inner periphery of the drum by means of hydraulic pressure, an air-tight joint will be formed between the drum and the side members.

Packing leathers x are fitted along the side and bottom edges of the holders p, being fixed thereon by the angle bars y, and having for their purpose to prevent leakage of water or air past such holders into the vacuum or suction box c. At a point diametrically opposite its aperture e, the suction box c is formed with a web or support z carrying a foot piece 1, the lower surface of which is part-cylindrical to fit the interior surface of the drum d.

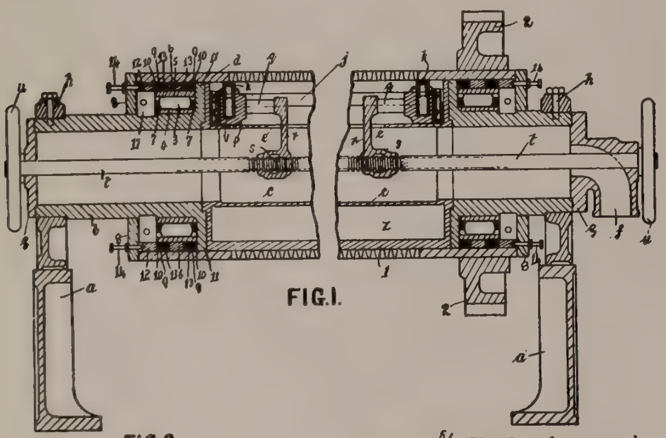


FIG. I.

FIG. 2.

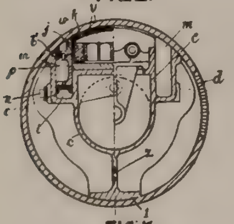


FIG. 3.

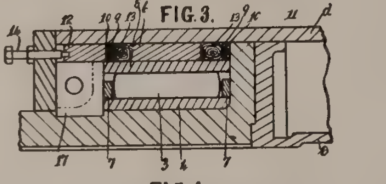


FIG. 4.

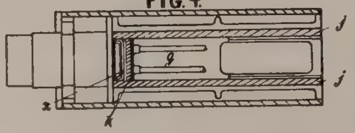
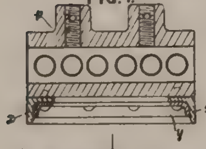


FIG. 7.



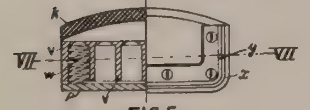


FIG. 5.

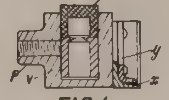


FIG. 6.

The drum d, which is driven for example by the toothed ring 2 shrunk or otherwise fixed therein, runs upon the antifriction bearings around the trunnions b. Such bearings may comprise rollers 3 running upon steel sleeves 4 fixed on the trunnions b and within a steel casing or bushing 5 which is connected with the drum d by a ring 6, preferably of cast iron, which is slidable between the drum d and casing 5 but is nonrotatable in relation therewith. The rollers 3 run between the end spacing rings 7, and the assembled parts of the bearings are secured in place by a divided cast iron ring 17, which is interposed between the cover ring 8 and the bearing parts. Rings 9 are arranged to turn with the casing 5, and similar rings 10 are arranged between the inner rings 9 and the flanges 11 on the trunnions and also between the outer rings 9 and sliding rings 12. In the spaces between the ends of the rings 6 and the rings 9 are inserted rolls 13 of sheet asbestos impregnated or covered with rubber and well greased, or any other suitable packing material, and it will be seen that by screwing up the bolts 14 the rings 12 will be forced inwardly in the axial direction, thereby compressing the rolls 13 and causing them to make a tight joint between the drum d and the casing 5. At the same time the axial pressure due to the screwing up of the bolts 14 does not set up undue friction owing to the presence of the rings 9 and 10, which rub against one another and take the wear, as well as preventing binding of the drum to the stationary parts as might happen in the absence of these rings 9 and 10.

It will be seen that in an apparatus fitted with these improvements, the fluid tight sliding joint between the drum d and the suction box c is quite independent of the atmospheric pressure which in previous machines of this type, was utilized to force these parts together when a vacuum was set up in the suction box c. Consequently, heretofore, if a high degree of vacuum were employed the suction box and drum were held together so tightly that the drum became practically inoperative. In other cases the high vacuum could not be maintained owing to faulty packing arrangements. Now in the improved arrangement the suction box c is absolutely prevented from moving out of concentricity with the drum d and the formation of the fluid tight sliding joint is entirely due to the operation of the packing strips and bars j k, consequently the degree of vacuum employed may be as high as it is possible to obtain and nevertheless the power required for driving is reduced. In addition, the drying action is increased by the higher degree of vacuum which can and may now be employed.

It must be pointed out that it is important to provide means for preventing leakage between the holders p and the drum c and between the longitudinal packing strips k and their holders p. Reference to Figs. 2 and 4 will show that the ends of the strips k fit nicely against the strips j to press tightly against the interior of the j by the rams l, not only causes the upper edges of the strips j to press tightly against the interion of the drum, but owing to the engagement of the curved surfaces of the strips j and drum d, there may be a tendency for the strips j to move laterally a little and to tightly press against the ends of the strips k. When the transverse packing strips k are moved towards one another from the position seen in Fig. 1, it will be noticed that the water and air have access to the spaces on the outer sides of the strips k and their holders p through the side perforations in the drum. In these circumstances the packing leathers x, which extend down the sides and along the bottom of the holder p, prevent such water and air from leaking past the holder into the suction box c.

The roller bearing which preserves the concentricity of the drum d with the trunnions b and also facilitates the movement of the drum, is protected against the entry of water or liquor by the rolls of packing material 13 herinbefore described and the tightness of the packing can be adjusted as desired through the agency of the adjusting screws 14 and the axially slidable rings 12 and 6.

The invention is not confined to the use of a suction box of the particular cross section described, as other known forms can be substituted without departing from the invention.

The arrangement comprising hydraulic devices for forcing the longitudinal packing bars j upwards and springs for forcing the transverse strips or bars k upwards, offers many practical advantages. The longitudinal bars being of great length require to be pressed upwards with uniform effect is attained by dydraulic means which are readily applied owing to the holders of the longitudinal strips or bars j being relatively immovable. As the transverse bars or strips k are comparatively short, springs are effectively applied for operating upon such bars and, as the holders p are slidable, the use of springs obviates any difficulty which might be encountered in supplying hydraulic pressure to such slidable holders p.

The direct contact between the transverse packing members and the longitudinal strips is important for various reasons. Heretofore it was proposed to guide the longitudinal strips between fixed walls both of which extended substantially to the inner face of the perforated drum, but which necessarily were slightly spaced from said drum, in order to afford necessary clearance. The transverse packing members operated against the inner faces of the inner walls. As a result there was a material amount of leakage over the edges of the inner guide walls and apparently eddy currents were formed which at the take-off point of the roll caused variations in suction and consequent change of the take-off point. This was apt to cause the breakage of the sheet and at times nonuniform drying. By having direct contact between the transverse packing members and the longitudinal strips, the availabe suction with the consequent breaking of the sheet is eliminated. Furthermore, the efficiency of the apparatus is increased and the useless leaking of air into the suction box is diminished.

MANUFACTURE OF PAPER SUITABLE FOR SECURITY-CHECKS.

Menzies and Aitken, of Musselburgh, Scotland, Patentee.

U. S. Patent No. 1, 086,386.

This invention relates to improvements in the art of producing paper suitable for security checks, stamps and other documents, by incorporating in the paper pulp in the process of manufacture of paper, or impregnating the partially or completely manufactured paper with, a compound of such nature that when the paper so treated is written or printed on with ordinary ink a reaction will take place as a result of which the color of the ink will be indelibly mordanted in the fibers of the paper.

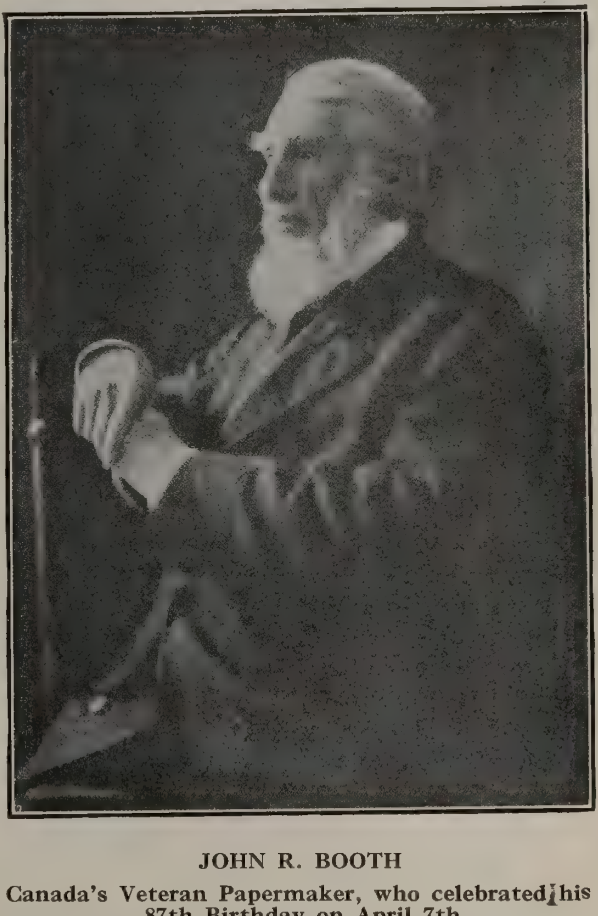
According to the invention, there is incorporated in the paper pulp, or the partially or completely manufactured paper is impregnated with, a soluble thiocyanate, preferably thiocyanate of ammonium, and a soluble salt of lead, desirably in such proportions that the insoluble thiocyanate of lead produced by the combination, will amount to 5 to 20 per cent of the weight of the paper more or less; or there may be added directly to the pulp or paper thiocyanate of lead, desirably in the proportion of 5 to 20 per cent of the weight of the paper 35 more or less.

DECISION IN LUMBER CO. CASE

The decision handed down in the Court of Appeals in the case of the Northern Crown Bank against the Great West Lumber Co. was in favor of the Bank, the Court being unanimous in its finding and full costs for the proceedings throughout were awarded to the Bank.

The case involved a sum of approximately $60,000. The action arose through the denial on the part of the lumber company of its liabilities. Large advances were made to this company by the bank a number of years ago. When these advances had reached a certain sum the bank, it is alleged, took an active part in conduct of the business. It was urged that the control the bank exerted became so large that the lumber company was relieved from the responsibility for any losses which might have been incurred.

On the first trial Chief Justice Harvey gave a decision in favor of the lumber company. This decision is now unanimously reversed by the full court.



JOHN R. BOOTH

Canada's Veteran Papermaker, who celebrated his 87th Birthday on April 7th

John Martin of the John Martin Paper Co., of Winnipeg, who have branches in Calgary, Regina and Edmonton, was in Toronto and Montreal last week, Mr. and Mrs. Martin have been spending some time in Indiana, and also visited New York and other eastern cities. Business in the west is improving in the paper line, and the outlook for the coming season is good, according to Mr. Martin who, during the last three years, has built up a very large trade in all lines of paper.

BRITISH TRADE NEWS

SPECIAL TO PULP & PAPER MAGAZINE

London, April 2, 1914.

The coating paper mill of Messrs. A. E. Reed & Co., Ltd., at Maidstone, in Kent, one of eight owned by the same firm, which was burnt down in August 1913, has been entirely rebuilt. The mill had two machines, and was run by steam. Now electricity has been resorted to, and the mill is one of the finest and most up-to-date structures any paper man could lay eyes on. The whole of the motors and controlling appliances have been supplied by a well-known English house with a high reputation. All the motors have a speed variation of from 500 to 1,200 R.P.M., thereby giving complete control over the drying process for the paper. The original method of driving was by beltt ransmission from the main engine, by which means it was impossible to get the proper speed at the various changes of the atmosphere for drying the paper. The electrical installation is giving great satisfaction to Messrs. Reed, both in utility and running cost, the saving of the cost of large belts being a marked feature in the adoption of electrical power. Messrs. Reed are one of the go-ahead firms in England and Canada, and the head of the firm is recognized as one of the best practical manufacturers of paper in Great Britain. His vast knowledge of mill work has compelled him to adopt electricity, and the future of the mill at Maidstone—known as Bridge Mill—will be watched with the keenest interest.

Scottish Wood Pulp.

In the United Kingdom recently a good deal of attention has been given to the question of re-afforestation and forests, so much so that the government has given grants to help on the movement. Short references to these grants have appeared already in the Pulp and Paper Magazine. The subject has now been taken up by Mr. Thomas Tait of Messrs. Thomas Tait & Sons, Ltd., Inverurie paper mills, in Scotland, who has written a letter to the Aberdeen "Free Press" in which he says that his family reclaimed 117 acres, also planting a part of the unreclaimed, and the balance he has just completed planting, with the help and advice of the University authorities and the Royal Agricultural Society. Of the planted portion, says Mr. Tait, it is interesting to note that from the spruce already matured his firm had made excellent pulp and paper, and they have also made trials from forests on Donside. He forwarded a specimen of the paper to the "Free Press" and the editor of that journal says the paper which was made 16 years ago, from wood grown on the Castle Forbes estate, is white and sharp, and crisp to the touch, as if it had come from the mill yesterday. It shows that there can be no question whatever about the quality of wood pulp produced in Scotland. It is excellent, he concludes, and all that is needed is that the supply be made adequate in quantity. Messrs. Tait & Sons are the sole pulp makers in Scotland, and they are deeply interested in the question of re-afforestation, being of the opinion that if the subject is handled in the right way, with the assistance of the University men, the paper industry may benefit thereby.

Edward Lloyd Ltd.

Considering the dullness of the paper industry during the latter part of 1913, a most remarkable feature of the annual report for last year issued by Edward Lloyd, Limited, is the considerably larger profits secured, when the results are compared with 1912. The increase is attributed to the more active demand for every description of paper throughout the world and an increased production of pulp and paper at the company's different mills. They also say that economies in manufacturing have compensated to some extent for the present low selling price of the finished product. Profits rose from £140,337 to £152,362, an increase of £12,025, and as the much larger balance of £23,629 was brought down, the total is £175,992 in comparison with £156,729. To reserve £20,000 is again placed, and after paying the Preference dividend the total distribution on the Ordinary shares is raised from 10 per cent to 11¼ per cent, while the balance brought forward is substantially increased to £41,498. The report says there now appears to be some slackening in the requirements of most countries, and shareholders must be prepared for some diminution of activity of trade in 1914. With the addition mentioned the reserve account will stand at £60,000, while investments in the balance-sheet amount to £98,455, so that the financial position of Edward Lloyd, Ltd., is a remarkably strong one. Two features of this company Canadians would do well to take a note of—one is the company's investments and the other is the company's pension fund.

John Dickinson & Co., Ltd.

The report of John Dickinson & Co., Ltd., paper makers and wholesale stationers, makes the bald statement that "after making the usual depreciation and providing for interest on debenture stock and preference stocks, the net profit amounts to £87,794, as compared with £99,471 last year," and does not indicate what appropriations are to be made, or the rate of dividend to be paid on the ordinary shares. Even this information, slight though it is, is a great improvement on the previous report, when not even the amount of profit realized was made known, the balance sheet showing one item of "sundry reserves and profits." It is stated with regard to the past year, that despite the fall in profit, the total sales were again increased in the face of increased competition and enhanced cost of materials. The principal reduction in profit occurred at the Croxley paper mills; owing to the employment of a number of new workers inexperienced with the methods and machinery of the mill, on the introduction of three shifts instead of two, an unexpected increase in waste occurred, in addition to the increased wages. It has been found necessary, therefore, to revert to the two shifts system. Serious delays have also occurred in the delivery of the new boilers, so that the electric power plant, on which a considerable amount of capital has been expended, is not yet in operation, but it is anticipated to be working by the middle of this year. The change back from the three shifts to two shifts shows that the experiment, which was only on trial, has proved a failure and should put a stop to all the talk we hear lately about the three-shift-system.

Deal in Irish Paper Mills.

Mr. F. Becker, of Messrs. Becker & Co., Ltd., London, and Mr. Neil Turner, also of London, were defendants in a case, heard in the Chancery Courts, in which Mr. Isaac Nathaniel Lyons sought a declaration that he was entitled to one-third of the profits made or to be made directly or indirectly, as shareholders in any company or otherwise by the defendants or other of them by reason of the purchase, sale or dealings in certain mills in Ireland. He also sought an injunction to restrain the defendants from parting with such profits, or, alternatively, a claim for remuneration on a quantum meruit basis. The plaintiff was interested in negotiating sales of properties, and was acquainted with a director of Kynochs, who owned paper mills in Ireland, and for which the plaintiff was authorised to find a purchaser. He introduced the subject to Mr. Becker and Mr. Turner, upon the terms that they should purchase and that any profit they made should be divided between the three of them. After the purchase had been made the plaintiff learned that Mr. Becker had caused the Irish Development Company, Ltd., to be formed, and that he was dealing with the matter unsatisfactory to the plaintiff. The judge dismissed the case and said the plaintiff's claim was for profits which other people had to work for at their own risk. The plaintiff had no legal claim whatever. At present there had been no profit except the profit on the resale, and he thought the claim of the plaintiff was absurd. Defendants repudiated the contract and were not called upon to answer the case.

Machinery for Experiments.

The government of the Federated Malay States have placed an order for a complete plant for investigating fibres with Messrs. T. J. Marshall & Co., Ltd., Stoke Newington, London. Amongst the fibres to be tested for paper making will be hedychium coronarium. The plant, which will be delivered in June, comprises a cylinder mould machine with strainer complete, small vertical boiler, revolving boiler, kollergang, beating engine, electric motor, etc., all calculated on the basis of 28 lbs. dry weight of material. The same firm has also received an order from the Imperial Institute, South Kensington, London, for one small beater, and a set of hand-moulds. The Institute is experimenting with elephant grass from Uganda, Nilotic payrus and Hedychium Coronarium with a view to ascertaining their qualities for papermaking.

Bergvik Co., Ltd.

The directors of the Bergvik Co., Ltd., pulp makers, announce a dividend of 12 per cent on the deferred shares for the past half year, making 15 per cent for the year. Mr. Curtis, president of the company, at the annual meeting said that the average selling price of pulp during the last year was better than in the previous year. For 1914 they had already sold almost the whole of their output. During the last six months business in England had been very quiet, but their sales had been satisfactory on the continent and in America. He saw no reason why the price of pulp should fall. There were very few mills being put up in Scandinavia and from reports he had received building in Canada was not excessive. The future difficulty of pulp mills appeared to be where to get their pulp logs, but fortunately in their own case they had a large area of freehold forest. The production of alcohol as a by-product at their mill had shown satisfactory results, although there was not the demand for it that was expected.

New Use for China Clay.

China clay is to be used more in the manufacture of soap, and the news should be good for clay producers in Canada. Fats used in soapmaking cost about $120 a ton, whereas China clay can be bought from $4 to $6 a ton. The information has caused much satisfaction in Cornwall china clay circles, but from a papermakers point of view, the news is not very encouraging, because the demand at present exceeds the supply, and if soapmakers get into market it is greatly to be feared that clay prices will make a considerable jump. America will feel the pinch greater than the English paper manufacturers, but Canada will not be materially affected. Besides, Canada has clay mines of her own to fall back on. The new discoveries made are up to the present kept a trade secret, but it is known that soapmakers have used china clay for some time past. China clay is now used in pottery, papermaking and soapmaking. What will be the next turn?

Paper Making in Wales.

Rather disappointing results are shown by Thomas Owen & Company, the Cardiff paper manufacturers, in their report for the past year. This is attributed mainly to the labor troubles at their Hjerpen works, which resulted in a three months' strike. The net profits, after deduction of debenture interest, depreciation, etc., amounted to £5,800 as against £15,800 in the previous twelve months. A dividend of 3 per cent on the preference shares is announced, leaving a balance of £700 to be carried forward. Nothing is added to the general reserve fund to which there was an addition of £3,000 in 1912. Messrs. Owen are big producers of news-

Mr. Dubuc in London.

Mr. Dubuc of the Chicoutimi Pulp Company is on a business visit in London, and has spent a good deal of time with his agents. Messrs. Becker & Co., Ltd. It will be remembered that some time ago the Chicoutimi Company entered into some very big contracts for the supply of pulp in England. Mr. Dubuc's friends on this side were glad to see him—this is his second visit inside 18 months—and no doubt on his return to the Dominion he will have some good news to announce for the information of Canadians. Indeed, it would do no harm if Canadian pulp men would visit London more frequently and personally pick up some of the contracts that are given away to other sources.

CHICOUTIMI LUMBER & PULP CO.

New financial arrangements have been completed in London by Mr. J. E. A. Dubuc for the Chicoutimi Lumber and Pudp Co., and the concern will shortly undertake extensions to its plant in the Lake St. John district, involving an expenditure of approximately $4,000,000.

To provide for the new financing the company last November ratified a scheme for the conversion of its 5 per cent. bonds into 6 per cent. bonds. Later the company took out supplementary letters patent at Ottawa increasing its capital stock from $1,000,000 to $7,500,000 and provision was made for issuing preference shares in a £1 denomination.

PULP AND PAPER NEWS

The lumber season was a good one in the Ontario woods during the past winter. Figures have been compiled by the Department of Lands, Forest and Mines showing that the cut of pulp wood was 225,250 cords; pine 350,000,000 feet board measurement; spruce, 7,5000,000; hemlock 35,000,000 feet, other varieties of timber 75,000,000; hard wood (beach and maple) 5,000,000; charcoal wood, 60,000 cords; railway ties, 5,500,0000. The total figures was 472,500,000 feet, board measurement.

Recently the Associated Boards of Trade of Ontario waited upon the Ontario Government and presented resolutions passed at the annual meeting of the Association held in Toronto. One of the requests was for the appointment of a provincial fire marshall, with a view of preventing fires as far as possible and keeping buildings free as far as can be from dangerous substances. The Ontario Government will establish such a department and there will be a fire marshall, with a staff of deputies, who will be fully equipped to investigate all questionable fires and take all possible steps to prevent the great waste therefrom. The insurance companies will bear the expense of the department and the province will not be put to any outlay in connection with the department. The insurance fund will be provided by a tax of one third of one per cent of the gross premiums received by the insurance corporations on all business transacted in Ontario during the previous year. Chief Ten Eyck of the Hamilton Fire Department is mentioned as a likely appointee for the position of Fire Marshall.

Thomas Gain, sales manager of the Don Valley Paper Co., Toronto, who recently completed his thirty-sixth anniversary in connection with the paper trade, was one of the first salesmen in that line to ever visit Winnipeg and the West. His initial trip to the Prairie capital was made, over twenty-seven years ago, via Chicago before the C.P.R. was completed. In those early days the traveller could not do business and get away in a day or two as at present. He was compelled to hang around three or four weeks and to make several calls, many of them of a social nature, before he could secure his full allotment of orders. After a number of trips, Mr. Gain was able to cut down the time to fifteen days. He was then with the Lincoln Paper Co., of St. Catharines, serving that firm nineteen years and opening up their Toronto branch.

The annual meeting of the Pacific Burt Co. was held in Toronto last week. The annual statement showed earnings for 1913 to be $73,568 as against $79,669 in 1912. The usual dividends were paid, and the sum of $36,000 carried forward to profit and loss as against $32,405 in the previous year.

A meeting of the hemlock lumbermen was held in Toronto last week. There is said to be a great demand for hemlock among the dealers. During the past winter there was rather more snow than usual in the bush, and the report that the logs are tied up and that there will be an increase in this class of lumber is denied. Toronto lumbermen say that they do not anticipate an advance in the price at present and the trade outlook is very good.

The apparent indifference of manufacturers in the Old Country towards Canadian import trade has prompted the Canadian Chamber of Commerce in London, Eng., to establish a British Manufacturers' section. Nearly one hundred firms, among them some of the most prominent paper houses, have joined the section, and it has been decided to take collective action immediately to capture a larger portion of the import trade in the Dominion of manufacturerd goods. Another matter, which will receive early consideration, will be the Canadian transportation problem taking into consideration the freight position as it will exist consequent upon the working of the Panama Canal.

Fibre shipping cases, the first of the kind produced in Canada, are now being manufactured by the Canada Paper Box Company, Cote Street, Montreal, who have installed a large plant for this purpose.

The Hinde and Dauch Paper Co., of Canada are now manufacturing sanitary corrugated boxes for shipping bread, etc., at their factory in Toronto. They point out, that when in camp the Canadian Militia demands that corrugated boxes be used for the shipment of bread. A number of Toronto bakers are now using these boxes which keep the loaves fresh and dust proof.

H. B. Hart, managing director of the British American Wax Paper Co., Toronto, is at present in England. He recently lost his father and while abroad will attend to various business matters in connection with the estate.

After a week's illness from pneumonia, W. B. Newsome died recently in Toronto. He was born in Charlottetown, P.E.I., in 1849, and for over thirty-five years carried on an extensive business as a law stationer in Toronto.

A special meeting of the Canadian Manufacturers' Association was held in Toronto last week at which the Workmen's Compensation Bill, now before the Ontario Legislature, was discussed, and steps will be taken to place the objections of the Manufacturers to certain principles of the bill before the Ontario Government. The form in which the specific protests will be presented is being drafted.

In a recent address before the Canadian Institute, Toronto, on "Fire Protection for Forest Reserves," Dean Fernow of the Faculty of Forestry of Toronto University, said that in comparison with British Columbia, the fire protection of the wooded wealth of the provinces was not as efficient, although the protection in connection with the forest reserves of Ontario was very good. He also stated that the United States has over twice the timber area of Canada.

George Pauline, who represents Robert Fletcher and Sons, Manchester, Eng., manufacturers of tissue, bond and other papers, was in Montreal, Toronto and other places on business this week.

C. H. L. Jones, manager of the Lake Superior Paper Co., has been appointed assistant to W. E. Stavert, President of the Spanish River Pulp and Paper Mills, Limited, with headquarters at Sault Ste. Marie, where the offices of the President are now located. The purchasing and operating departments of the Company are now conducted at the Soo, and all business in these branches transacted at that point. The offices of T. H. Watson, Vice-President, and John G. Sutherland, sales and traffic manamer, remain in Toronto.

The Toronto Paper Manufacturing Co.'s mill at Cornwall, which has been closed down for some time owing to the government building new concrete retaining walls at Locks 17 and 20, will start operations again on April 20. In the meantime the plant has been given a thorough overhauling.

The eight-column wide newspaper seems to be gaining in popularity and recently the Toronto Telegram, the Toronto News and other papers of the province have been enlarged in size from seven to eight column sheets.

The area of Algonquin Park is being increased by the Ontario Government from 2,741 square miles to 3,047 square miles by the acquisition of 306 square miles of limits from the Pembroke Lumber Co., at a cost of $185,000. The object of the purchase is to promote reforestration and to retain the timber for future use.

The Barber mill of the St. Lawrence Paper Mills, at Georgetown, Ont., is being electrically equipped so that the beaters, Jordan engines, etc., will be run by motors.

John R. Barber, President of the Barber-Ellis Co., who for many years had his office in the Mail and Empire Building, Toronto, until he disposed of all his interests in the various paper manufacturing companies with which he was identified, has so far recovered his health as to be a frequent visitor to Toronto, and now has an office at the Barber-Ellis warehouse.

The Lansdowne Lumber Co., of Toronto, which was organized in 1912 with a capital of $40,000, recently made an assignment to J. P. Langley, Toronto. The liabilities are about $10,000. Peter Thompson is the President of the Company, and George Mustard, Manager.

Fred Lancaster has been appointed Maritime representative of the Canada Paper Co. with headquarters at Halifax, succeeding Norman W. Latter, who was for nearly a quarter of a century in the service of the company, and passed away recently after several months' illness at the early age of thirty-seven years.

A bill has been introduced in the Ontario Legislature by Hon. W. H. Hearst, Minister of Lands, Forests, and Mines, stipulating that no license holders, corporations, etc., will be allowed in future to make campaign donations toward the election of any parliamentary candidate, and requiring all candidates to give publicity to campaign contributions.

James Logie, manager of the Toronto branch of the E. B. Eddy Co., who has been ill, is able to resume his duties.

Joseph Kilgour, President of the Canada Paper Co., who is an enthusiastic admirer and breeder of good horses, entertained a large number of his friends to a private horse show on April 11 at Sunnybrooke Farm, near Toronto. Mr. Kilgour, it will be remembered, placed his farm at the disposal of the yeomanry of York county last fall when an old-fashioned ploughing match was held for the first time in many years.

One of the largest sawmills in Northern Ontario at Tomigo Village, belonging to Ferguson and McFadden was totally destroyed by fire on April 2. The loss is estimated at over $50,000.

The Weatherhead Paper Co., of Toronto, which recently took over the business and assets of the George Powley Paper Co., is being incorporated. The capital stock is $40,000. It is understood that the new concern will branch out considerably and handle many new lines of paper.

W. A. Newton, Toronto, Canadian manager of the Albertson Engineering Co., of Kalamazoo, Mich., has secured a patent on a new beater and washing engine, which it is reported effects a great saving in power, and possesses many other advantages. The beater is of the revolving type.

Fire recently destroyed the cheese box factory of St. Vandervoort near Belleville, Ont., doing about two thousand dollars damage.

F. A. Ritchie, of Ritchie and Ramsay, coated paper manufacturers, New Toronto, who has been spending the past two months in the West Indies, has returned after an enjoyable outing. He was accompanied by R. L. Patterson, manager of Miller and Richard, typefounders, Toronto.

In connection with the purchase of certain timber limits of 307 square miles by the Ontario Government, in Algonquin Park for $185,000 from the Pembroke Lumber Co., a lively attack was made on the Department of Lands, Forest and Mines in the Ontario Legislature last week. C. M. Bowman of North Bruce, contended that the timber was so scattered as to be of little commercial value, and he characterized the purchase as "loot and plunder for the benefit of political friends." He moved an amendment fixing the purchase price at $20,000. Hon. Mr. Hearst, in a warm reply, said that the attack was most unwarranted and unfair. Nothing had been concealed, and the fullest reports had been made. The best timber cruisers in the province had gone over these limits, and checked up every acre. They estimated that the commercial value of the timber on it was at least $300,000. An independent authority on lumbering, Charles Henderson of Sudbury, had written that he considered the estimate under rather than over the mark. "I am convinced," Mr. Hearst added, "that the province never had a better chance to secure good timber land for conservation. We are getting three hundred square miles of land for a trifle less than one dollar an acre."

OCEAN FALLS CO. AFFAIRS.

According to recent reports, it is held that the Ocean Falls Company may soon be in a position to commence operations at Cousins Inlet, B.C. The property was to be offered at auction by the debenture holders by order of the Supreme Court, which, if carried out, would have meant a considerable loss to the shareholders. It was therefore deemed advisable to make some effort to avert the sale, and accordingly Mr. Lester W. David, the first president of the company, as well as the promoter, was sent to England on behalf of the shareholders and creditors. On the day previous to the advertising sale a cablegram was received from Mr. David stating that he had been successful in forming a syndicate of Englishmen, backed by Sir Robert Perks and the Equitable Trust Company of New York. The syndicate will pay off the first and second bondholders and also all creditors in full. At the auction sale no bids were received, the auctioneer refusing to state the reserve bid. In all probability the English syndicate offer will be accepted and the plant which has never been operated will begin active work.

Balsam Fir for Pulpwood

That balsam fir, a tree which a few years ago was considered of little value, is now in demand for pulp wood, is the statement made by the Department of Agriculture in a bulletin just issued on the subject. The demand has been brought about, says the Department, by the enormous expansion of the pulp industry during the past two decades, with its present consumption of three and a quarter million cords of coniferous wood and the consequent rise in the price of spruce, the wood most in demand for paper making. In addition, the department goes on to say, balsam has begun to take the place of spruce for rough lumber, laths and the like, as the price of the latter wood has risen.

The chief objection to the use of large amounts of balsam fir in the ground-pulp process of paper making is said to be due to the so-called pitch in the wood, which injures the felts and cylinder faces upon which the pulp is rolled out. Balsam fir does not have a resinous wood, and the material which gums up the cylinder probably comes from grinding balsam under conditions adapted to spruce wood. Yet from ten to twenty-five per cent and possibly more of balsam can be used in ground pulp without lowering the grade of the paper produced. It is known that with balsam logs left lying in water over a season this drawback practically disappears.

In chemical pulp, produced through the action of acids, these acids are known to dissolve the pitch and any amount of balsam can be used, though some claim that too much balsam in the pulp gives a paper that lacks strength, snap and character.

At the present time balsam fir furnishes about six or seven per cent of the domestic coniferous wood used by the country's pulp industry. The tree itself constitutes, numerically, about twenty per cent of the coniferous forest in northern New York and Maine, and is abundant in many parts of New Hampshire, Vermont and in the swamps of northern Michigan, northern Wisconsin and Minnesota. It readily reforests cut-over areas and attains a size suitable for pulp wood in a short time.

Under present methods of cutting, balsam fir is said to be increasing in our second-growth forests at the expense of red spruce, and with the gradual decline in the supply of the latter wood the fir will become more and more important commercially.

DIRECTORY OF PAPER MAKERS.

The 1914 issue of the Directory of Paper Makers of the United Kingdom marks the 38th annual publication of this useful compilation of information regarding the paper industry in the Old Country. The chief feature in this edition are the lists of paper makers., etc. of England and Wales, Scotland and Ireland under all the various headings carefully and arithmetically revised to date; numerous additions to the list of trade designations; actual watermarks and trade names of great value to printers, stationers, etc., and paper trade customs.

This directory is one of the most complete of its kind and all the information is so well arranged alphabetically and indexed as to be easily accessible. In addition to being of great service to the trade it contains a very complete directory of paper makers' engineers, purveyors of raw materials, suppliers, etc., as well as information of infinite value to stationers, printers, etc. The directory is by Messrs. Marchant, Singer & Co., 47 St. Mary Axe, London, E.C.

"THE MAIN DRIVE."

This interesting booklet published by the Federal Engineering Company of Montreal and Toronto contains much information relating to belts and belt driving of great value to managers, superintendents, engineers and others interested in the saving of money on belting bills. The booklet contains descriptions of the beltings manufactured by this firm and actual photographs showing them in operation under varying conditions. Also descriptions, illustrations and price lists of the belting supplies handled and general information on the ordering and care of belts. A very useful booklet for reference.

A USEFUL CATALOGUE.

The general catalogue No. 38 of the H. W. Caldwell & Son Company, Chicago and New York, manufacturers of elevating ,conveying, power transmitting and general machinery, is one of the most complete references of its kind, and shows distinctly the high standard set by this firm in all its undertakings. The catalogue gives some idea of the wide variety of machinery manufactured by this firm, covering with illustrations, diagrams, tables of dimensions, etc., most of the lines placed on the market.

The plant of the H. W. Caldwell & Son Co., in Chicago, occupies an entire city block, is entirely new and of modern construction. The principal buildings consist of the main machine shop fitted for both light and heavy machine work, the sheet metal and conveyor department and a modern foundry. The power is distributed electrically from their own power plant. A separate warehouse and shipping department enables them to carry an adequate stock and ship orders promptly upon completion and without danger of confusion or mistake.

The plant is served by switch from the Chicago Junction Belt Railroad, enabling them to secure and forward cars by all railroad lines centering in Chicago, and is equipped with modern tools of every character necessary to economically produce their line of manufactures and maintain a high grade of workmanship.

The catalogue will be found valuable to mill engineers, etc.

HOW TO BUILD UP BOILER EFFICIENCY.

This book, which is in its seventh edition, written by Jos. W. Hays, combust ion engineer and author of several leading works in connection with combustion and the use of coal, has rightly been called, "A Handbook of Fuel Economy." It treats the subject in 5 reels: "Why your fuel is wasted," "How your fuel is wasted," "How to 'spot' your fuel wastes," "How to stop your fuel wastes," and "How to keep the wastes stopped," which, when handled right about answers a good many problems that are continually bewildering engineers.

The other editions of this book have met with a good reception and the present edition contains much revised matter and many additions. Very little is said relating to the theory of combustion, but the author has handled the discussion of practice with much lucidity and illustration, the effort being to show those interested how they may proceed at once to actually mark a real reduction in the coal bills.

The book is published by Jos. W. Hays, Rogers Park, Chicago, Ill. Price $1.00, postpaid.

A PERSONAL REVIEW OF ATTEMPTS TO UTILIZE VARIOUS FIBRES FOR PAPERMAKING

By CLAYTON BEADLE.

We all know what was done or attempted one hundred years ago and more. It has been referred to over and over again in historical books on papermaking. These various attempts only show from time to time the dearth of sufficient raw material to cope with the world's ever increasing demands.

My first attempt to make use of any kind of new raw material was about 1885-6 when straw pulp was made at Dartford by the Leunig process and used at various mills in the neighborhood. Among other mills, it came to those of Messrs. Wm. Joynson & Son. It did not come at that time in the form of bales but in compressed masses. I rather fancy it was carted over a distance of about 8 miles and dumped down in a loose condition. I am inclined to think that the price of the bleached pulp was somewhere in the neighborhood of £24 a ton dry. It was treated by a chlorinating process, the details of which I have forgotten. The process was abandoned because it did not pay. It soon became realized that straw could not be economically treated in this country. The straw pulp has to come from abroad.

A few years subsequent to that, straw pulp again came on the English market in the form of rolls, generally in a moist condition. It was at that time very much subject to mildew. Here and there, there were black patches of mildew. I have known as much as 25 per cent soluble matter as the result of mildew and putrefactive changes taking place in bleached straw pulp. The aqueous extract from such pulp showed the presence of a large proportion of sugary or dextrine-like bodies. Of course such pulp had to be re-bleached.

It was in 1887, the Jubilee year, when my father and brother visited America and my father was very much struck with the enormous wastage of cotton seed hulls which had to be got rid of by burning under the boilers, that he shipped 10 tons over to Joynson's mills and I was put in charge of the experiments. I have, I think, two or three notebooks full of experimental work on this product. The cotton seed hulls did not contain more than about 25 per cent of actual cotton. We ran several lots over a paper machine and actually measured the yield of paper from a given tonnage of the stuff. I have a book of samples showing the different trials made from the cotton seed hulls, good, bad and indifferent. Of course, it was an impossible thing to treat hulls in this way, but I devised a process of wet mechanical separation. After boiling and washing, the hulls became loosened from the cotton and, by passing the hulls suspended in water down a V shaped trough with a slot at the bottom, so as to allow the hulls to drop through the bottom, and by causing air to bubble underneath the hulls, the cotton was kept on the top of the water by means of the bubbles of air ascending and the heavy particles of hull fell down and passed through. This is nothing more than a matter of interest because the whole idea of treating the hulls is a mistake.

About ten years ago I had a long talk with Sir Edward Partington on the subject of the treatment of hulls and he related to me his experience. I forget the details of it, but he informed me that he treated very large quantities of hulls and he had somehow or other got a process of wet mechanical separation of the husk. I think it was by treating it in a hollander or a breaker, the bottom of which was provided with gratings so that the separated husk could fall through and the cotton fibre remain suspended. It was the same idea only in a much more practical way.

We all know the subsequent history of cotton seed cotton; how that by a dry mechanical process of separation it has become not only a feasible proposition but bids to become a very large industry. We now see how entirely we were on a false track in the methods that we then employed, the fatal mistake being to attempt to treat the whole hulls by any chemical process. It was not until some dry mechanical separation process was devised that it became a feasible proposition to utilize the material for papermaking. Now it is a first class product.

About 1886 the Indian & Colonial Exhibition was held. Many people, I expect, are now not even acquainted with the existence of such an exhibition, and few would be acquainted with the importance of the work that was done. I was at the time with Messrs. Wm. Joynson & Son, and my cousin Mr. Edmund H. Joynson, in company with Mr. Cross and myself, came to London and attended one of the conferences held on the subject of examining and reporting upon the variour fibroes which were submitted from different parts of the British Empire. The upshot of this was that Mr. Joynson undertook to co-operate with Messrs. Cross and Bevan for the purpose of investigating any fibres which might be of service in the manufacture of paper. Mr. Joynson placed the services of his mill at the disposal of this research work and appointed me his representative to undertake the work on his behalf. He also financed the work generally, and it was really due to his initiative that the work was so thoroughly carried out, which initiative was largely supported and encouraged by Mr. Cross.

The reports were divided into two sections; one is contained in the reports of the Colonial Sections of the Exhibition, published in book form, the other paper making report is contained in a separate communication published by Spon by the authority of the Secretary of State for India on Indian Fibres and Fibrous Substances. This latter report was communicated by Messrs. C. F. Cross, C. J. Bevan and C. M. King in association with Edmund H. Joynson. I was given the bulk of the chemical work which is contained in the various tables. This work was done partly at the laboratories of Messrs. Cross and Bevan at New Court, but to a large extent at St. Mary Cray, the more practical part of it being done at the mills.

I can only say that, as the result of all this work, no new fibre was introduced to the paper trade. Some few fibres were actually put over the paper machine. I remember well one fibre, CROTOLARIA JUNCIA (Sunn Hemp), in one trial gave a most excellent result —in fact it was equal to linen—but other trials were made and we failed to get such an excellent result, and could not account for the uncertainty of the material. A long time afterwards (Feb. 1897) I published a description of the value of Sunn Hemp for papermaking in "The Paper-Maker." At that time, although caus-

and chemicals without any allowance for labor or overtic soda was comparatively cheap, the cost for materials head charges, ran into at least £20 a ton. The fibre could be delivered over here at £13 a ton. It was a fibre which was much more valuable for textile purposes than for papermaking. I have a book of samples of these papers at the present time. I just give that as an instance of the practical outcome of all this laborious work.

We tried such fibres as PHORMIUM TENAX (New Zealand hemp) which again is a textile fibre and too valuable to be used in the manufacture of paper. Many years afterwards I visited New Zealand and got all the information I could upon the subject of PHORMIUM TENAX, and was entirely confirmed in my opinion that it could never be brought into service as a paper making material, although it may get there, as no doubt it does, in form of waste ropes, etc.

I had to attend the conferences at the Exhibition, the other gentlemen being too busy on their other work. It was held at the offices of Dr., now Sir, George Watt, who has since been the author of that large and standard work "Economic Products of India." I remember at a meeting seeing old Mr. Routledge and hearing him expatiate upon the value of bamboo. He brought a bale of bamboo half stuff. At the same exhibition was old Mr. Lloyd of Edward Lloyd and Sons, who was looking out for new fibres. It was before the real days of wood pulp. At that time mills like Lloyds' employed esparto, rags and other materials in the manufacture of their paper. In fact they employed such materials in the manufacture of news at a considerably later date. Now such things would be unthinkable, but it just shows the changes that have taken place since that time. Everything is being overshadowed by wood.

One fibre that we had in sufficient quantities for running over a paper machine was the so-called Porcupine grass of Australia. It was run over the paper machine at St. Mary Cray in the presence of Sir Samuel Davenport and Mr. Scott. I was taken at the time with the qualities of this material and still have in my possession a number of samples of the papers produced at the time. Many years later, when I visited Australia, I went to see Sir Samuel Davenport and we arranged to ship more of the grass over and made further trials, but nothing finally came of it. He asked me, when at Adelaide, if I would do him a favor. I said I would do anything I could for the kindness that he had shown to me. He asked me to get up a cabinet of samples of paper making products and present them to the Museum at Adelaide. This I did on my return.

At the conferences was also Mr. Bryan Donkin, the descendant of the old historic firm of Bryan Donkin & Co. He also showed great interest in all new fibres and at his request about this time I made some trials at St. Mary Cray with some fibres which he submitted.

We used at St. Mary Cray a little beater made, with the exception perhaps of the spindle of the roll, entirely of bronze. I should like to refer to this because, although this little machine was made by Donkins nearly 30 years ago, and I think cost perhaps about £60 or £70, it was the most useful type of miniature beater that I have ever used. In a small beater used for experimental purposes, it is a great mistake in my opinion to put the bars in with wooden slips between the bars, as is often done, unless there is a proper ring to hold them in their position. I found the most useful type of bar was all in one piece with the roll. In fact the roll was a solid piece of bronze planed out so as to form bars. We also had, of course, small boilers to work by the sulphite or the soda process, and all the necessary paraphernalia.

There was also the treatment of Marram grass which I need not enter into here; but I remember among other things we attempted to treat Banana. We boiled it in quantity and began to put it over the paper machine. Banana is very funny stuff to handle. It works, or is liable to work very wet. It would not part with its water. The stuff came up to the couch roll in a pool and ran over the edges, however, slowly we worked the machine. Although it is allied to HEDYCHIUM very closely botanically, it is very different in this respect, because Hedychium, although it has the feeling of being very wet in the beaten state, can produce papers which are very strong and parchment-like, and at the same time part with its water on the machine quite freely. Banana is wet in any sense particularly because it refuses persistently to part with its water. We were obliged to shut down the machine running on Banana and all we could get was a number of sheets produced on hard moulds. But since this time banana paper has been produced without these difficulties, at least not so much accentuated. It has not succeeded from a practical point of view and I am very doubtful whether it ever will. I could give a lot of figures of yields which would support my view in this respect, but it would take up too much space to refer to it in detail now.

Then we have the fibre Lallang. About this time, or perhaps a little later, the then Sultan of Johore granted a concession for the utilisation of Lallang for paper making. The work of exploiting the fibre was put into my hands. At that time I was a member of the firm of Cross and Bevan. We produced a brochure and a book of samples showing what could be done with the fibre, what its cost of treatment would be, etc. Nothing however came of these wonderful concessions, but the whole subject was revived by Dr. Stevens and myself in the communications we made to paper journals about four years ago. We took a renewed interest in the subject because the material was brought to our notice again as chemists to the Rubber Growers' Association. It is a pest to the rubber planter. Many thousands and perhaps hundred of thousands of pounds have been spent by the various estates in the East in eradicating Lallang and, when we showed that it was a likely material for the manufacture of paper, the idea being scouted by the rubber planters. "What do we want to have to do with a material which is nothing but a weed and which we wish to eradicate?" They would not listen to any attempts to use it, or to cut it, bale it and export it, or anything of that sort, their only interest being to get rid of it, weeding it up, burning it and destroying it. Now, however, if you will read what is taking place in the East, there is an attempt being made in government departments to reinvestigate the Lallang for paper making purposes. Whether anything will come of it or not, it is difficult to say. The fibre is there in enormous quantities and it resolves itself into the same old question—it is merely a matter of £ s. d., a question of transport, baling, shipping, etc. But with the development of paper making in the East, the supply of Eastern markets, increased mills in India, Japan, China, Australasia, etc., a different complexion may be put upon the possibility of utilizing a fibre such as Lallang for the manufacture of paper.

Pulp and Paper Industry Finland, 1913

In the industrial field, work has been carried on with, on the whole, good results. As far as concerns the leading branch, the timber trade, the year has been one of exceptional prosperity. Already in 1912 the prospects were of the best, and in 1913 they were still better. The production has, by reason of good inquiry, been increased as much as possible and prices have throughout been, to say the least, fully satisfactory. According to the statistics of the Sawmill Owners' Federation the output has been as follows, in standards:

1910	420,643
1911	456,710
1912	463,975
1913	536,593

On November 1st, 1913, the percentage of the woodgoods sold was 95 per cent of the calculated production, which exceeds by about 5 per cent the already very satisfactory corresponding figure of 1912 and is decidedly higher than the corresponding figures of the previous years.

The export has during the whole year been registering very high figures, and the official statistics now at hand, covering the first eleven months of the year, are a good deal in advance of any previous figures. Up to the end of November the export quantities have been as follows, in thousand cubic metres:

Year	Unmanufactured timber.	Props and pulpwood.	Hewn timber.	Sawn timber.	Firewood.
1910	443	1,340	230	3,020	670
1911	526	1,528	264	2,990	700
1912	462	1,612	268	3,263	911
1913	521	2,322	284	3,992	983

Especially the most valuable part of the export, viz., sawn timber, is thus indicating a total far in advance of the previous years. The increase over 1912 is not less than 700,000 cubic metres, or nearly 25 per cent. The paper trade has been enjoying a fairly good year, although not an equally good one as the sawmills. As concerns wood pulp, the prices have, on the whole remained on about the same level as during the latter part of 1912 and can thus be described as fairly satisfactory. Of mechanical pulp the export has diminished, making for the eleven months only 29,258 tons (reduced to dry weight) as compared with 44,173 tons in 1912. This is brought about by many of the pulp mills having entered upon the production of mill boards on a larger scale. There having also been during the autumn scarcity of water in many rivers, this circumstance has also played in, several mechanical mills having been forced to materially diminish their output.

As far as concerns chemical pulp, the inquiry has been a very good one, and the prices obtained have been high ones. The export has not been over large, making up to the end of Novembr 1913 62,018 tons, as against 69,630 tons during the corresponding period of 1912.

Finally it can be noted with satisfaction, that the export of our most valuable article in the pulp and paper trade, viz. of paper, is showing good progress for the year now under review. During the first eleven months of the year the export of paper has been as follows, in thousand tons:

1910	96.6
1911	112.2
1912	117.6
1913	132.7

On the other hand, the pices obtained during 1913 have been somewhat declining.

ROSIN IN SULPHITE CELLULOSE.

Too large a percentage of sulphite cellulose causes unpleasantness and difficulties particularly when manufacturing newspaper at a high speed of the machine. Various attempts at remedies were made; the method of cooking, emptying and washing in the cellulose mill were frequently changed, but without success. As the difficulties due to rosin were greater in winter than in summer the following method was adopted.

The pulp was thoroughly washed in the digester with water of 10—20 deg. C. driven in from below by means of a powerful centrifugal pump. The requisite rinsing took place from above with hot water. In order to obtain the necessary quantity of luke-warm water the water of condensation was collected from the digesters and the cooling water from the gas-coolers and sulphur-kilns. Sufficient water of 40 deg. C. was thus obtained for washing the pulp in the digester and for diluting the pulp for its preparation.

In this manner a temperature of the washing water which remained constant summer and winter was obtained and a corresponding diminution of the disagreeable percentage of rosin. Rosin from the waste lye congeals and adheres to the fibres when the waste lye is cooled down to a certain degree before it is separated from the chemical pulp.

WILL ADOPT PROFIT-SHARING PLAN.

The Peninsular Paper Company, of Ypsilanti, Mich., inaugurated a profit-sharing plan on April 1 similar to that adopted the first of the year by the Farr Alpaca Co. of Holyoke, Mass.

The plan is based on the equal division of dividends between capital and labor. Each man who has been employed continuously from April 1, 1914, to January 1, 1915, will receive the same per cent. dividend on his wages as is paid to stockholders on the stock of the company.

The plan is to be tried out for the period mentioned, and it is confidently expected by the officers of the company that results will justify its continuance.

A feature of the plan provides that in case of the dismissal of any employee for cause during the term mentioned, any dividend accruing on his wages for the period he has worked will not revert to the company, but will be used to establish a fund for the gradual pensioning of old and disabled employees.

The plan has the enthusiastic support of the men, who feel that the size of these dividends depends largely on their ability to avoid waste in time and materials and thus increase the earnings of the company.

As an inducement to employees for ideas to further efficiency, suggestion boxes have been placed about the mill and cash prizes offered for all suggestions adopted by the company.

The Markets

Canadian Markets

The market conditions remain much the same as they have been for some time. Improvements are noted at times in certain branches of the trade, but any added business only comes in spots, and does not keep up. News print plants are well employed, and prices are ruling about the same. Book and writing mills are moving along steadily, but orders are for the most part small and necessitate frequent changes in the runs. Wrapping paper conditions are dull, and the general jobbing turnover was only moderate during the past month. Ground wood pulp is quiet, and the outlook is not exceptionaly brisk, while sulphite conditions are fair, and prices govern the same as they have been for several months. All the mills have now a good supply of water, and the past winter has been favorable for the getting out of pulp wood.

The general trend in the paper and pulp lines is toward conservatism and while many new projects are under contemplation, still no great expansion in the trade will likely be evidenced until normal financial conditions are firmly established. The rag and paper stock market is fair with roofing stock showing some tendency to increase in price. Most of the lines moving in domestic rags, old papers, etc., are on contract.

There is a latent feeling in the trade that with the advent of warmer weather and after the Easter holidays are over business in many lines will show a gain.

The following quotations prevail.

News (rolls $1.95 to $2.00 at mill in car load lots.
News (sheet $2.10 to $2.20, at mill in carload lots.
News (sheet) $2.25 to $2.50, depending on quantity.
Book papers (carload) No. 3, 3.75c to 4.25c.
Book papers (ton lots) No. 3, 4c to 4.50c.
Book paper (Carload) No. 2, 4.25c.
Book papers (ton lots) No. 2, 4.50c to 5.25c.
Book papers (carload) No. 1, 4.75c to 5.25c.
Book papers (ton lots) No. 1, 5.25c to 6.00c.
Writings, 5c to 7½c.
Sulphite Bond, 6½c to 7½c.
Grey Browns, $2.00 to $2.50.
Fibre, $2.75 to $3.50.
Manilla B., $2.40 to $3.50.
Manilla, No. 2, $2.75 to $3.75.
Manilla No. 1, $3.25 to $4.25.
Unglazed Kraft, $3.75 to $4.50.
Glazed Kraft, $3.90 to $4.75.

Pulp.

Ground wood (at mill), $15 to $15.50.
Ground wood, $21 to $24, delivered in United States.
Sulphite (unbleached), $41 to $43, delivered in Canada.
Sulphite (unbleached), $42 to $44, delivered in United States.
Sulphite (bleached), $56 to $57, delivered in Canada.
Sulphite (bleached), $56 to $58, delivered in United States.

Paper Stock.

No. 1 hard shavings, $1.87½ to $1.90, f.o.b., Toronto.
No. 1 soft white shavings, $1.75.
No. 1 mixed shavings, 50c.
White blanks, 92½c to 95c.
Ordinary ledger stock, $1.15 to $1.20.
Heavy ledger stock, $1.40 to $1.50.
No. 1 book stock, 75c.
No. 2 book stock, 45c to 50c.
No. 1 Manilla envelope cuttings, $1.10 to $1.15.
No. 1 print Manillas, 60c.
Folded news, 45c to 50c.
Over issues, 50c to 52½c.
No. 1 clean mixed paper, 30c.
Old white cotton, $2.50 to $2.75.
Thirds and blues, $1.30 to $1.32½.
No. 1 white shirt cuttings, $5.00 ta $5.25.
Blue overall cuttings, $3.50 to $3.60.
Black overall cuttings, $1.75.
Black linings, $1.75.
New light flannelettes, $4.75.
Ordinary satinets, 75c to 80c.
Flock, 90c.
Tailor rags, 70c to 80c.

Quotations f.o.b. Montreal are:—

Book and News Paper.

Roll News, $40 to $43 per ton for large orders; $45 to $50 per ton for small orders.
Ream News, $45 to $47 per ton for large orders; $50 to $60 per ton for small orders.
No. 1 Book, 5¼c to 6c per lb.
No. 2 Book, S.C., $4.50 to $4.75 in large quantities; $4.75 to $5.50 in small quantities.
No. 3 Book, M.F., $4.00 to $4.25 in large quantities; $4.40 to $4.50 in small quantities.
Writings, 5c to 7½c.
Sulphite Bond, 6½c to 8½c.

Wrappings.

Grey Brown, per 100 lbs., car lots, $2.25 net; 5 tons $2.45; 2 tons, $2.55; 1 ton, $2.65; less, $2.75.
Red Brown, car lots, $2.85; 5 tons, $2.95; 2 tons, $3.05; 1 ton, $3.15; less $3.25.
B. Manilla, car lots, $2.85; 5 tons, $2.95; 2 tons, $3.05; 1 ton, $3.15; less, $3.25.
No. 2 Manilla, car lots, 3.10; 5 tons, $3.20; 2 tons, $3.30; 1 ton, $3.40; less, $3.50.
No. 1 Manilla, car lots, $3.25; 5 tons, $3.45; 2 tons, $3.55; 1 ton, $3.65; less $3.75.
Kraft, $3.75 to $5.00.
Fibre, car lots, $3.25; 5 tons, $3.45; 2 tons, $3.55; 1 ton $3.65; less $3.75.

Most of the manufacturers are quoting 10 per cent. less than the above prices to the jobbing trade on the cheaper lines of wrapping, such as B. Man., No. 2 Man.—grey and red browns.

Pulp.

Sulphite easy bleaching, $43 to $45 per ton.
News quality, $41 to $42 per ton.
Bleached sulphite, $54 to $59 per ton.
Kraft pulp, $3.60 to $4.00.
Ground woods, No. 1, $15 to $16.
Ground wood, No. 2, $22 to $24, delivered United States.

New York Markets

Office Pulp and Paper Magazine,
206 Broadway, New York.

Movement in sulphite pulp during the interval has been mainly in contract channels. Mills are fairly well supplied with orders for their output and are taking their normal consumption on contract. New business is rather quiet. but there are numerous inquiries in the city. Paper mills are confident that the values of foreign pulp will go down and are not anxious to close at current figures. Some importers also predict a downward movement. The market for domestic sulphite has been strengthened by the withdrawal of one of the large manufacturers of pulp from the source of production. The demand for sulphate and krapt pulp has been fairly good until about a week ago when there was a falling off. Some new contracts were closed at prevailing figures for long periods. The spot market has been practicaly dead for a week. Advices from abroad show that foreign mills are making better offers for contracts covering longer periods than for one year. Spot orders are commanding prices ranging from 1.85c to 2.00c. The market for soda is quiet.

Plentiful supplies of water have led to the grinding of large quantities of wood for mechanical pulp. Some manufacturers have already contracted for this year's output and are now making normal shipments in satisfaction of requests from mills. The spot market is not quite as active as it was but the price is still firmly maintained at $22 to $24 a ton. No contracts for ground wood pulp have been made for less than $16.50 a ton at the mill. The closing of certain mills left excess supplies on hand and the grinders holding agreements with these firms offered the lots at a price somewhat below market quotations.

Domestic Rags have been in active inquiry at current values. Roofing stock has been in good demand and prices have an upward tendency. The difficulty in this market is in satisfying the demand for satinettes of all grades. Current values for roofing stock are 1.15c to 1.25c a pound for satinette garments; 1c to 1.10c and .70c to .75c a pound for Nos. 3 and 4 respectively. The market for bagging and old rope has been uneventful during the interval, the principal feature being the softening of jute bagging. Contract importations have been normal.

All grades of old waste papers have been in good demand and prices have been firm. Soft and hard white shavings are moving briskly in contract channels at 1.80c to 1.90c and 2.40c to 2.50c a pound respectively. All kinds of flat stock command good prices and inquiries for them are numerous. The lower grades are somewhat higher in value than at the first of the year but the demand for them is a little easier as one of the largest consumers has gone out of the market. Prices have not gone to the height of a year ago. Spot orders require prompt delivery which is difficult in some cases.

Pulp.

Ground Wood, No. 1, $20 to $24, delivered.,
Ground Wood, No. 2, $17 to $19, delivered.
Uubleached sulphite, dom., 1.90c to 2.20c delivered.
Unbleached sulphite, imptd, 1.75c. to 2c, ex dock, N.Y.
Bleached sulphite, demestic, 2.80c. to 3c delivered.
Bleached sulphite, imptd, 2.60c to 3.05c ex dock, N.Y.
Easy Bleaching, impt. 2.05c to 2.20c ex dock, N.Y.
Unbleached sulphate, imported, 1.75c to 2.10c per pound, ex-dock, New York.
Bleached sulphate, impt., 2.60c to 2.80c, ex dock, N.Y.
Kraft pulp, imported,, 1.80c to 2.00c, ex dock, N.Y.
Soda pulp, domestic, 2.10c to 2.25c, delivered.

Paper.

There has been a great deal of pessimism in the talk of local trade. The interval has shown a tendency to counteract the weak side of the paper market. The extreme ease in the local money market has brought about free collections. The general tendency at present is one of saving and very little investment. Travelling men in town say that mills are all running full and seem to have plenty of orders for their output. Specialty papers still dominate and enjoy a good demand. March was one of the best months in this branch of the industry. Newsprint during March moved normally. Easter advertising and special editions strengthened the market to a considerable extent and consumption on contracts is about caught up. Transient orders are plentiful at prevailing quotations. Side runs are plentiful, with a rather poor demand. Current price is 2c a pound. The demand for book papers reflects no easing tendency and values in all grades are firm. Some manufacturers anticipate an increase in the price of book papers in the near future. The demand for coated grades has eased off to some extent but there has been no cutting of prices. Wrappings are quiet in demand but values in all grades are firmly maintained. Bonds, linens and ledgers are in a little better demand and prices are firm. There is an increasing demand for the medium grades of writing at prevailing figures. Krafts are not as active as they were a short time ago and values are very low. About half the tissue mills in the country have reduced the price of No. 1 white to 40c on car lots. There is little new business, however, but a fairly brisk movement along the lines of outstanding orders, most of which were made during the summer of 1913 when prices were low. Boards have been active and some manufacturers have raised the price of news board to $31 to $33 a ton. It is also said that the value of chip and straw board is likely to go up in the near future. Due notice and warning has been sent to certain toilet paper manufacturers who have neglected to comply with all the requirements of the Brooks net count law which became effective on February 1 of this year. The demand for these papers has been good and the value fairly firm. Paper towels and cigarette papers are in good demand at prevailing prices which are firm.

News, rolls, transient business, $1.95 to $2.05 f.o.b.
News, rolls, contract renewals, $1.95 to $2.00 f.o.b.
News, sheet, $2.25 to $2.30 f.o.b. mill.
Book papers, car lots, C. & S. C., $4.00 to $4.50 f.o.b.
Book papers, car lots, M.F.S., $3.75 to $3.90 f.o.b.
Writing paper superfine, 13½c to 17c, del. east of Miss. River.
Writing paper, extra fine, 11c, del. east of the Miss. River.
Writing paper, No. 1, fine, 9c, del. east of the Miss. River.
Writing paper, No. 2, fine, 8c, del. east of the Miss. River.
Writing paper, engine sized, 4½c to 8c, del. east of the Miss. River.
Bond paper, 5c to 24c, delivered east of Mississippi River.
Ledger paper, 8c to 30c, delivered east of Mississippi River.
Linen paper, 7c to 18c, delivered east of Mississippi River.

Manila jute, 4¾c to 5¼c, delivered.
Manila, wood, $2.40 to $3.00, delivered.
Kraft, No. 1, $3.50 to $3.75 f.o.b. mill.
Kraft, No. 2, $3.25 to $3.50, f.o.b. mill.
Boxboards, news, $30 to $33 per ton, delivered.
Boxboards, chip, $28 to $31 per ton, delivered.
Boxboards, straw, $28 to $31 per ton, delivered.
Wood pulp board, $42.50 to $45 per ton, delivered.
Tissue, white, cylinder, 40c to 42½c, delivered.
Tissue, fourdrinrie, 47½c to 50c, delivered.
Tissue, jute Manila, 40c to 42½c, delivered.

British Markets

(Special to Pulp & Paper Magazine.)

London, April 2, 1914.

Dullness and inactivity are still predominant features of the British paper industry and agents, as well as manufacturers, are complaining bitterly of the slow state of trade. The demand for newsprint during the past two weeks has been remarkably small, and mills engaged in the production of this class of paper are receiving an unpleasant check. Wrappings are also very dull, but good quality printing paper is finding a satisfactory consuming channel in the publishing and large printing houses in London and the provinces. New business in other kinds of papers is limited, and the prospects before mill men at the moment of writing are not very encouraging. It is greatly to be feared that the British paper trade is going through rather a severe strain, similar to what was experienced at the close of 1913, and judging by the statements that have been made at the annual meetings of paper companies recently a warning has been given that no large profits need be anticipated unless the present dull and inactive state of business becomes completely revolutionized at once. Most of the mills show declining profits, and as all efforts have failed to secure an increase in the price of papers of every description, mill men have had to give serious attention to labour saving machinery and to working out a decrease in the cost of production. Unemployment is still somewhat high at the mills and machinery in very few cases is running at full capacity. From the continent the news reaches London that the paper industry there is still in a gloomy condition, and business transactions are unsatisfactory.

* * * *

There is an improvement in the sulphite and sulphate market and a few contracts have been settled at prices satisfactory to producers, notwithstanding the fact that paper mill owners have been holding back for some considerable time. Sulphite easy bleaching and sulphite strong are now firm. Good grades of soda pulps are inclined to be hardened as regards prices and the outlook is more cheerful. Scandinavians report that enquiries from American sources are still plentiful, and business is done at full prices. The European markets, however, are affording them very little profit. The Germans are stated to be creating a greater interest in the American market, owing, no doubt, to the recent dealings with Scandinavia and the dull state of the European paper industry. Quotations are about as follows:—

Sulphite bleached (No. 1)	$56.40	to	$62.40
Sulphite Easy Bleaching (No. 1).	37.20	to	39.60
Sulphite news	38|40	to	39.40
Soda unbleached (No. 1).	34.80	to	36.40
Soda Kraft..	38.00	to	38.60

All prices are c.i.f., London, and other English ports.

The mechanical pulp market continues quiet and dull. There are rumours of a few contracts having been settled at current rates, but beyond these new business is scarce and supplies are delivered on standing contracts. These supplies have recently been somewhat heavy, so it may be taken for granted that stocks at mills, considering the depressed state of the paper trade, are large. Scandinavians also report that their mechanical business is also lifeless, so much so that Norway has gone down as low as kroner 31 and kroner 32 to fix up a sale. These prices also included the agent's commission and they show that even the Norwegians are in sore straits for business. Prices are about as follows in England:—

Pine 50 per cent moist (unwrapped)	$10.08	to	$10.75
Pine dry	20.40	to	30.20

All prices are c.i.f. London and other English ports.

Rags of all descriptions and grades are experiencing a limited demand, but prices are unaffected. Stocks in most of the centres are plentiful and during the past months some good shipments have been made to Canada. The Esparto trade is still somewhat against the views of paper mill men, and prices are in sellers' favor. Only limited supplies are available for Spring and early summer shipment, and the market for new crop has not opened yet. Complaints are being heard of the continued high levels that Esparto has reached, and from all accounts there is no likelihood of an expected easement in the price for some time to come. Messrs. Ide & Christie report that: "Even viewing conditions, there would appear to be a sufficiently serious outlook over the next few months to justify sellers in stiffening their backs as to further engagements."

The chemical trade is going through a period of quietness. So far prices are unchanged. Bleaching powder is quoted $28.20, caustic soda $48 for 76-77 per cent per ton, soda crystals $13.80, sulphur $28.20 per ton, salt caske $10 per ton, ammonia alkali about $14 to $17.50 per ton, according to package. Rosin and sizing are very dull, and prices are very easy. China clay is in great demand, so much so that the accommodation at Fowey, in Cornwall, is not sufficient to cope with the shipping. Naturally, the recent pronouncement that clay is to be used in soap manufacture has caused the lievliest satisfaction amongst the clay men. Gypsum, pearl hardening and other fillings are dull, and prices unchanged.

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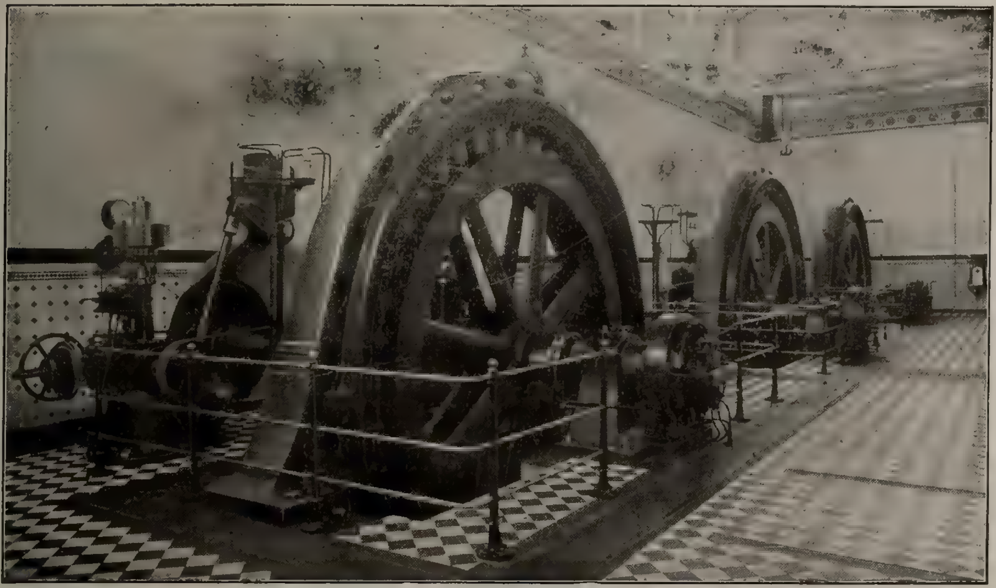

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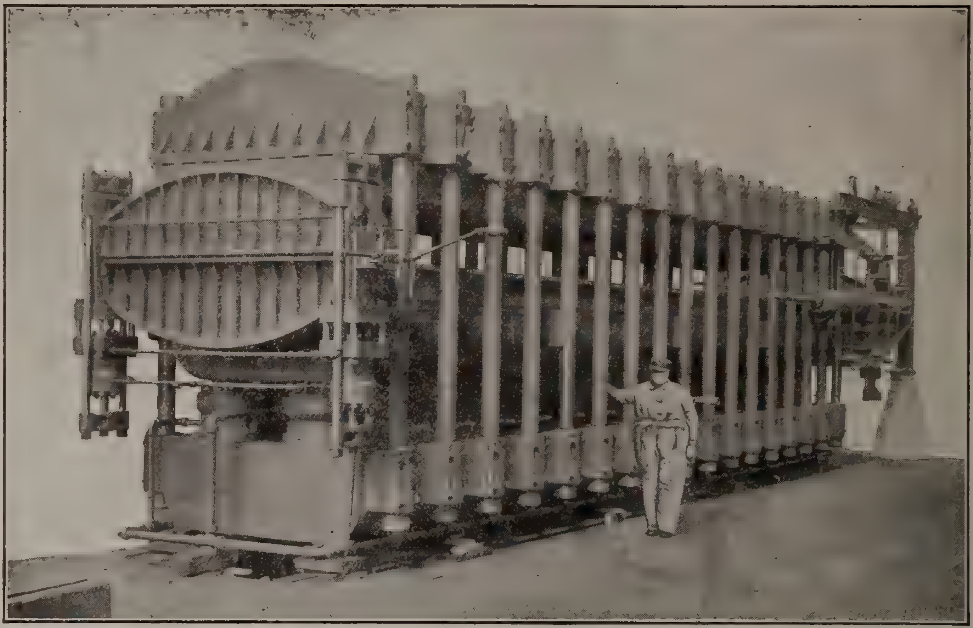

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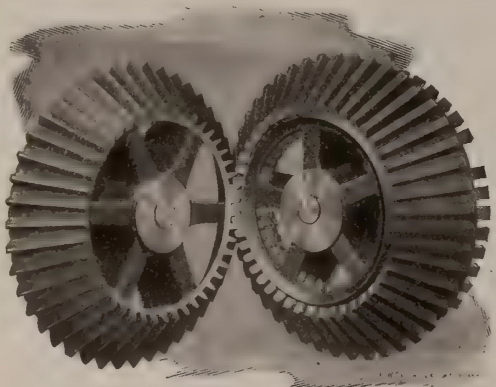

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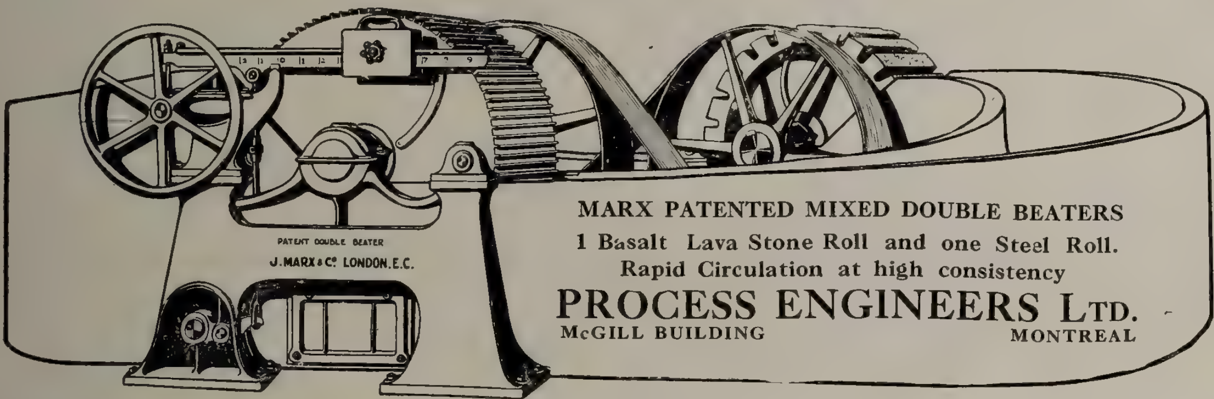

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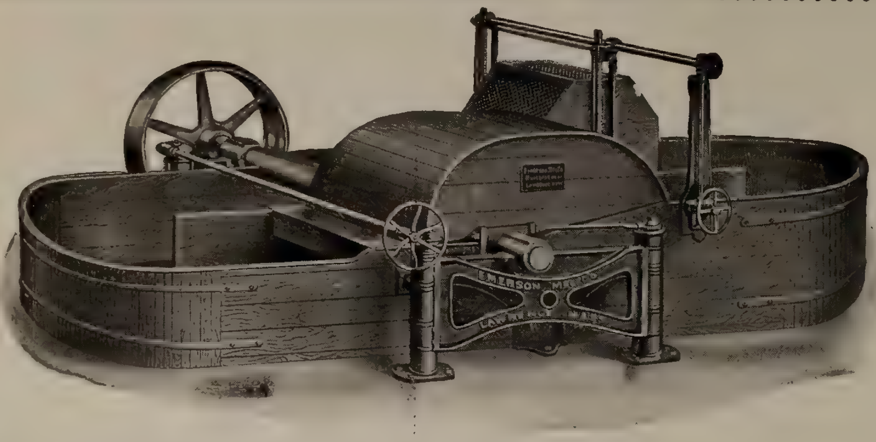

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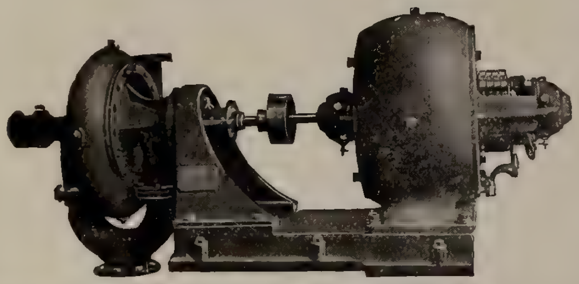

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Winn & Holland, Montreal, Can.
ain Crane
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
ain Blocks
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
ain Clutches
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
ain Slings
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
ina Clay
China Clay Co., Manchester, England.
Klipstein, A. & Co., St. Peter Street, Montreal, Can.
Paper Makers' Chemical Co., Easton, Pa.
Wilson-Paterson Co., Board of Trade Bldg., Montreal, Can.
ippers
Boving & Co., of Canada, Limited, Toronto. Ont.
Carthage Machine Co., Carthage, N.Y.
Valley Iron Works, Appleton, Wis.
ip Screens
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
anes
Boving & Co. of Canada, Limited, Toronto, Ont.
Hamilton, Wm. Co., Ltd., Peterboro, Can.
Northern Crane Works, Ltd., Walkerville, Ont.
Smart-Turner Mach. Co., Hamilton, Ont.
al Handling Machinery
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
anes—Gantry
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Cranes—Hand Power
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Cranes—Overhead Travelling
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Cranes—Post Jil
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Cranes—Wall
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Conveying Machinery
Caldwell, H. W. & Son Co., Chicago, Ill.
Jeffrey Mfg Co., Montreal, Can.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Couch Rolls
Bertrams Ltd., Edinburgh, Scotland.
Chambers Ltd., 152 Bay Street, Toronto.
Sherbrooke Mach. Co Ltd., Sherbrooke, Q
Cylinders
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co. of Canada, Limited, Toronto, Ont
Chambers Ltd., 152 Bay Street, Toronto.
Sherbrooke Machinery Co., Sherbrooke, Que.
Cutters
Bertrams Ltd., Edidburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Machine Co., Lawrence, Mass.
Cylinder Covers
Boving & Co., of Canada, Limited, Toronto, Ont.
Johnson, C. H. & Sons, Ltd., St. Henry, Montreal, Que.
Kufferath, Andreas, Mariaweiler, Germany.
Cylinder Moulds
Bertrams Ltd., Edinburgh, Scotland.
Chambers Ltd., 152, Bay Street, Toronto.
Sherbrooke Machinery Co., Sherbrooke, Que,
Cylinder Rolls
Capital Wire Cloth and Manufacturing Co. Ltd., Ottawa, Ont.
Dandy Rolls
Capital Wire Cloth and Manufacturing Co. Ltd., Ottawa, Ont
Chambers Ltd., 152 Bay Street, Toronto.
Johnson & Sons, C. H., St. Henry, Montreal, Can.
Marshall, T. J. & Co., Ltd., London, Eng.
Digester Lining
Boving & Co., of Canada, Limited, Toronto, Ont.
Panzl Digester Lining Co., Muskegon, Mich.
Preston's Digester Lining Co., Radcliffe, Eng.
Stebbins Eng. & Mfg. Co., Watertown, N.Y.
Digesters
Boving & Co., of Canada, Limited, Toronto, Ont.
Digester Gauges
Schaeffer & Budenberg, Brooklyn, N.Y.
Drainer Bottoms
Snell, Samuel, Co., Holyoke, Mass.
Dryers
Bertram Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Electric Cranes
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Elevating and Conveying Machinery
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Evaporators
Boving & Co., of Canada, Limited, Toronto, Ont.
Process Engineers, Ltd., Montreal, Canada.
Scott, Ernest & Co., Fall River, Mass.
Exhausters
The Sherbrooke Machinery Co., Sherbrooke, Que.
Experimental Machinery
Chambers Ltd., 152 Bay Street, Toronto.
Marshall, T. J. & Co., Ltd., London, Eng.
Process Enginners Ltd., Montreal, Can.
Exporters
Parsons Trading Co., New Tork, N.Y.
Felts
Ayers, Ltd., Lachute Mills, Que.
Bates & Innes, Ltd., Carleton Place, Ont.
Bredt, F. & Co., New York, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Dallyn, Jardine & Co., Toronto, Can.
Heimbach, Thos. Jos., Ltd., Duren, Germany.
Huyck, F. C., Albany, N.Y.
Johnson, C. H. & Sons, St. Henry, Montreal, Can.
Penmans, Ltd., St. Hyacinthe, Can.
Porritt, Joseph & Sons, -Manchester, Eng.
Spencer, J. H. & Sons, Bury, England. .
Tippett Arthur P. & Co., Montreal, Can.
Filters
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Norwood Engineering Co. of Canada, Ltd., Cowansville, P.Q
Fourdriniers Wires
(See Brass Wire Cloth.)
Friction Hoists
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Gauges
Schaeffer & Budenberg, Brooklyn, N.Y.
Generators and Transformers
Chambers Ltd., 152 Bay Street, Toronto.
Siemens Co., of Canada, Ltd., Montreal, Can.
Gravity Lowering Blocks
Morris, Herbert, Crane & Hoist Co., Toronto, Ont
Grinders
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage. N.Y.
Glens Falls Mach. Works, Glens Falls, N.Y.
Hamilton, Wm., Co., Peterboro, Can.
Jenckes Machine Co., Sherbrooke, Que.
Voith, J. M. Co., Inc., New York, N.Y.
Voith, J. M., Wurtemberg, Germany.
Waterous Engine Works Co. Ltd., Bran

MILL SUPPLIES---Continued

Heating
- Sheldons, Ltd., Galt, Ont.

Hand Hoists
- Morris, Herbert, Crane & Hois Co. nto, Ont.

Hoists.
- Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Northern Crane Works Limited, Walkerville, Ont

Hoists—Chain Electric and Pneumatic
- Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Hose
- Can. Consolidated Rubber Co. Ltd., Montreal, Can.

Jordan Engines
- Boving & Co., of Canada, Limited, Toronto, Ont
- Jones, E. D. & Co., Pittsfield, Mass.
- Process Engineers, Ltd., Montreal, Canada.

Knives
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Chambers Ltd., 152 Bay Street, Toronto.
- Crookes, Roberts & Co., Sheffield, Eng.
- Hay, Peter, Knife Co., Galt, Can.
- Tippet, A. P. & Co., Montreal, Can.

Kollergangs
- Bertrams Ltd., Edinburgh, Scotland.
- Boving & Co., of Canada, Limited, Toronto, Ont
- Chambers Ltd., 152 Bay Street, Toronto.

Laying Machines
- Chambers, Ltd., Toronto.
- Collis & Sons, J., London, Eng.

Motor
- Chambers Ltd., 152 Bay Street, Toronto.
- Siemens Co. of Canada, Ltd., Montreal, Can.

Packings
- Canadian Consolidated Rubber Co., Montreal, Can.

Presses
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Can. Boomer & Boschert Press Co., Montreal, Can.
- Chambers Ltd., 152 Bay Street, Toronto.

Paper Stock, Etc.
- Hough, R., London, England.
- Pullan, E., 490 Adelaide Street, W., Toronto, Can.
- Walker, J. R., & Co., 35 Common Street, Montreal, Can.

Paper and Pulp Machinery
- Beloit Iron Works, Beloit, Wis.
- Bentley & Jackson, Bury, England.
- Bertram, James & Son, Ltd., Edinburgh, Scotland.
- Bertram's, Ltd., Edinburgh, Scotland.
- Black-Clawson Co., Hamilton, Ohio.
- Canadian Boomer & Boschert Press Co., Ltd., Montreal.
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Carthage Machine Co., Carthage, N.Y.
- Chambers Ltd., 152 Bay Street, Toronto, Can.
- Dillon Machine Co., Lawrence, Mass.
- Emerson Mfg. Co., Lawrence, Mass.
- Farrell Foundry & Mach. Co., Ansonia, Conn.
- Fullner, H., Warmbrunn, Germany.
- Glens Falls Machine Works, Glens Falls, N.Y.
- Green Bay Barker Co., Green Bay, Wis.
- Hamilton, Wm., Co., Peterboro, Can.
- Harmon Machine Co., Watertown, N.Y.
- Jenckes Machine Co., Sherbrooke, Que.
- Jones, E. D. & Sons Co., Pittsfield, Mass.
- Johnson, C. H. & Sons, Ltd., Montreal, Can.
- Marx, I. & Co. London, E.C., England.
- Moore & White Co., Philadelphia, Pa.
- Process Engineers, Ltd., Montreal, Canada.
- Rice, Barton & Fales .Worcester, Mass.
- Sandy Hill Iron & Brass Works, Hudson Falls, N.Y
- Scott, Ernest & Co., Fall River, Mass.
- Sheldons, Ltd., Galt, Can.
- Sherbrooke Mach. Co., Ltd., Sherbrooke, Can.
- Smith, S. Morgan, Co., York, Pa.
- Stebbins Eng. & Mfg. Co., Watertown, N.Y.
- Ticonderoga Machine Works, Ticonderoga, N.Y.
- Valley Iron Works, Appleton, Wis.
- Voith, J. M., New York, N.Y.
- Voith, J. M., Wurtemberg, Germany.
- Walmsley, Chas. & Co., Bury, Eng.
- Waterous Engine Works Co., Ltd., Brantford, Can.
- Westbye, P. P., Peterboro, Can.

Paper Machine Tachomoters
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Schaeffer & Budenberg, Brooklyn, N.Y.

Paper Tester
- Chambers Ltd., 152 Bay Street, Toronto.
- Marshall. T. J. & Co., Stoke Newington, London. England.

Pneumatic Thickeners
- Sherbrooke Mach. Co., Ltd , Sherbrooke, Que.

Pneumatic Chain Blocks
- Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Press Rolls
- Bertrams Ltd., Edinburgh, Scotland.
- Chambers Ltd., 152 Bay Street, Toronto.
- Sherbroke Mach. Co Ltd , Sherbroke, Que.

Press Wire Cloth.
- Chambers Ltd., 152 Bay Street, Toronto.
- Kufferath, Andreas, Mariaweiler, Germany.

Pulp Stones
- Stancliffe Estates Co., Ltd., Darley Dale, England.

Pumps
- Bertrams Ltd., Edinburgh, Scotland.
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Canadian Allis-Chalmers, Ltd., Toronto, Ont.
- Carthage Machine Co., Carthage, N.Y.
- Chambers Ltd., 152 Bay Street, Toronto.
- Dillon Machine Co., Lawrence, Mass.
- Glen Falls Machine Works, Glens Falls, N.Y.
- Hamilton, Wm., Co., Peterboro, Can.
- Lawrence Machine Co., Lawrence, Mass.
- Lawrence Pump & Engine Co., Lawrence. Mass.
- Smart-Turner Machine Co., Hamilton, Can.
- Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.

Recording Gauges
- Schaeffer & Budenberg, Brooklyn, N.Y.

Recording Thermometers
- Schaeffer & Budenberg, Brooklyn, N.Y

Refiners
- Bertrams Ltd., Edinburgh, Scotland.
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Chambers Ltd., 152 Bay Street, Toronto.
- Marx, J. & Co., London, E.C., England.
- Process Engineers, Ltd., Montreal, Canada.
- Rice, Barton & Falls Mach. & Iron Co., Worcester, Mass.
- Voith, J. M., New York, N.Y.
- Waterous Engine Works Co. Ltd., Brantford, Can.

Rope Blocks
- Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Rosin Size
- Fox, Stockell & Co., London, Eng.
- Paper Makers Chemical Co., Easton, Pa.
- Process Engineers, Ltd., Montreal, Canada.
- Vera Chemical Co., North Milwaukee, Wis.
- Wilson-Paterson Co., Board of Trade Bldg., Montreal, Can.

Rosin Size Boilers and Dissolvers
- Boving & Co., of Canada, Limited, Toronto, Ont.

Rotary Sulphur Furnaces
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Canadian Pulp Mill Machinery Co., Montreal, Can.
- Stebbins Engineering and Manufacturing Co., Watertown, N Y

Rubber Goods
- Can. Consolidated Rubber Co. Ltd., Montreal. Can.

Runways—Hand operated
- Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Save-Alls
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
- Waterous Engine Works Co., Ltd., Brantford, Can.

Self Landing, Self Delivery Hoists
- Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Screen Plates
- Bertrams Ltd., Edinburgh, Scotland.
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Chambers Ltd., 152 Bay Street, Toronto.

Screens
- Bertrams Ltd., Edinburgh, Scotland.
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Chambers Ltd., 152 Bay Street. Toronto.
- Glens Falls Mach. Wks., Glens Falls, N Y
- Harmon Machine Co., Watertown, N.Y.
- Jenckes Machine Co., Sherbrooke, Que.
- Johnson, Chas., St. Henry, Que.
- Marx & Co., J., London, England.
- Process Engineers, Ltd., Montreal, Canada.
- Sherbrooke Mach. Co., Ltd . Sherbrooke, Que
- Tippet Arthur P. & Co., Montreal, Can.
- Voith, J. M., New York, N.Y.
- Voith, J. M., Wurtemberg, Germany.
- Waterous Engine Works Co. Ltd., Brantford, Can.
- Westbye, P. P., Peterboro, Can.

Shear Legs
- Morris, Herbert, Hoist & Crane Co., Toronto, Ont.

Slings
- Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Slitters and Re-Winders
- Bertrams Ltd., Edinburgh, Scotland.
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Cameron Machine Co., Brooklyn, N.Y.
- Chambers Ltd., 152 Bay Street, Toronto.
- Moore & White Co., Philadelphia, Pa.
- Ticonderoga Machine Works, Ticonderoga, N.Y.

Smelting Furnaces
- Boving & Co., of Canada, Limited, Toronto, Ont.

Straw Cutters'
- Bertrams Ltd., Edinburgh, Scotland.
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Chambers Ltd., 152 Bay Street, Toronto.

Straw Dusters
- Bertrams Ltd., Edinburgh, Scotland.
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Chambers Ltd., 152 Bay Street, Toronto.

Straw Digesters
- Boving & Co., of Canada, Limited, Toronto, Ont.

Strawboard Making Machines
- Bertrams Ltd., Edinburgh, Scotland.
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Chambers Ltd., 152 Bay Street, Toronto.

Steam Regulator
- Pickles, W. F., Buckland, Conn.

Stuff Chests
- Boving & Co., of Canada, Limited, Toronto, Ont.

Sulphite Mill Equipment
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Stebbins Engineeringand Manufacturing Co., Watertown, N.Y

Sulphate Mill Equipment
- Boving & Co., of Canada, Limited, Toronto, Ont.

Sulphur
- Union Sulphur Co., 17 Battery Place, New York, N.Y.

Sulphur Burners
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Glens Falls Machine Works, Glens Falls, N.Y.
- Stebbins Engineering and Manufacturing Co. Watertown, N.

Tachometers (Hand and Stationary)
- Boving & Co., of Canada, Limited,Toronto, Ont.
- Schaeffer & Budenberg, Brooklyn, N.Y.

Track Systems
- Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Tanks
- Canadian Allis-Chalmers, Ltd., Toronto, Ont.
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Hamilton, Wm., Co., Peterboro, Can.
- Jenckes Machine Co., Sherbrooke, Que.
- McDougall, John, Caledonian Iron Works, Montreal, Can

Thermometers
- Schaeffer & Budenberg, Brooklyn, N.Y.

Transmission Machinery
- Caldwell, H. W. & Son Co., Chicago, Ill.
- Canadian Allis-Chalmers, Limited, Toronto
- Boving & Co., of Canada, Limited, Toronto
- Jones & Glassco, Montreal, Can.

Traveling Cranes
- Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

MILL SUPPLIES---Continued

Turbines

Boving & Co., of Canada, Toronto, Ont.
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Smith, S. Morgan Co., York, Pa.
Voith, J. M. Co., Inc. New York, N.Y.
Voith, J. M., Wurtemberg, Germany.

Valves (Rubber)

Can. Consolidated Rubber Co. Ltd., Montreal, Can.

Water Wheels

Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Hamilton, Wm. Co., Ltd., Peterboro, Can.
Smith, S. Morgan Co., York, Pa.
Voith, J. M., New York, N.Y.

Wire Cloth for Paper Machines

Chambers, Ltd., Toronto.
Christie, Geo., Ltd., Glasgow, Scotland.
Johnson, C. H. & Sons, Ltd., St. Henry, Montreal, Que
Kufferath, Andreas, Mariaweiler, Germany.
Tippet, Arthur P. & Co., Montreal, Can.
Taylor, J. A., Montreal, Can.
United Wire Works, Ltd., Edinburgh, Scotland.
Westbye, P. P., Peterboro, Can.

Waste

Hough, R., London, England.

Wet Machines

Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Glens Falls Machine Works, Glens Falls, N.Y.
Hamilton, Wm. Co., Peterboro, Can.
Norwood Engineering Co. of Canada, Ltd., Cowansville. P.Q.
Process Engineers, Ltd., Montreal, Canada.
Sherbrooke Machinery Co., Sherbrooke, Can.
Voith, J. M., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford Ont.

PULP AND PAPER MILL PRODUCTS

This aims to be a complete list of the products of Canadian Pulp and Paper Mills, who are urged to send us lists of brands and watermarks, as well as the headings under which they wish to be indexed. Buyers who cannot meet their requirements from this list, are invited to communicate with the editor, who is in close touch with the mills, and will gladly furnish full information.

PULP MILLS

Ground Wood Pulp

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
Basin Electric Light & Power Co., Ltd., Montmagny, Que.
Beaver Co. Ltd., Thorold, Ont.
Belgo-Canadian Pulp & Paper Co., Shawinigan Falls, Que.
Brompton Pulp & Paper Co., Brompton and E. Angus, Que.
Booth, J. R. Ottawa, Ont.
Bronson Co., Ltd., Ottawa, Ont.
Clyde River Pulp & Paper Co., Ltd., Liverpool, N.S.
Colonial Wood Products Co., Ltd., Thorold, Ont.
Campbell Lumber Co., Weymouth, N.S.
Canada Paper Co., Ltd., Montreal, Que.
Chicoutimi Pulp Co., Chicoutimi, Que.
Compagnie de Pulpe de Dalmas, Dalmas, Que.
Davy, James, Thorold, Ont.
Eddy Co., The E. B., Ltd., Hull, Que.
East Canada Power & Pulp Co., Ltd., Nairn Falls, Que.
Foley-Rieger Pulp & Paper Co., Ltd., Thorold, Ont.
Ford, J. & Co., Port Neuf, Que.
Jacques-Cartier Pulp & Paper Co., Montreal.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
La Cie de Metabetchouan, St. Andre, Que.
La Havre Pulp Co., Ltd., Bridgewater, N.S.
Lake Megantic Pulp Co., Lake Megantic, Que.
Laurentide Co., Ltd., Grand Mere, Que.
MacLaren Co., Ltd., The James, Buckingham, Que.
McLeod Pulp Co., Ltd., Liverpool, N.S.
News Pulp & Paper Co., Ltd., St. Raymond, Que.
Nicolet Falls Pulp & Lumber Co., Nicolet Falls, Que.
North Shore Power, Railway & Navigation Co., Clarke City.
Northumberland Paper & Electric Co., Campbellford, Ont.
Nova Scotia Wood & Pulp Co., Ltd., Mill Village, N.S.
Ontario Paper Company, Thorold, Ont.
Ouiatchouan Falls Paper Co., Ouiatchouan Falls, Que.
Powell River Co., Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que.
Price-Porritt Pulp & Paper Co., Rimouski, Que.
Reed, A. E. & Co., (Nfld.), Ltd., Bishop's Falls, Nfld.
River-du-Loup Pulp Co., Ltd., Fraserville, Que.
Soucy, F. Florentine, Old Lake Road, Que.
Spanish River Pulp and Paper Mills, Ltd., Espanola, Ont., Sturgeon Falls, Ont., Toronto, Ont., and Sault Ste. Marie, Ont.
St. George Pulp and Paper Co., St. George, N.B.
Thorold Pulp Co., Ltd., Thorold, Ont.
Trent River Paper Co., Ltd., Frankford, Ont.
Union Bag & Paper Co., Cape Madeleine, Que.
Trent Valley Paper Mills, Glenmiller, Ont.
Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Q

Kraft

Brompton Pulp & Paper Co., East Angus, Que.
Dryden Timber and Power Co., Dryden, Ont.
New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
Quebec and St. Maurice Industrial Co., La Tuque, Que.
Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que

Soda Fibre

Canada Paper Co., Ltd., Montreal and Toronto.
Dominion Paper Co., Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.

Sulphite Fibre

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
Booth, J. R., Ottawa, Ont.
Dominion Pulp Co., Ltd., Chatham, N.B.
Edward Partington Pulp & Paper Co., Ltd., St. John, N.B.
Eddy Co., The E. B., Ltd., Hull, Que.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Lake Superior Paper Co., Ltd., Sault Ste. Marie, Ont.
Powell River Co., Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que.
Riordan Pulp & Paper Co., Ltd., Montreal, Que.
Spanish River Pulp and Paper Mills Ltd., Sturgeon Falls, Ont., and Sault Ste. Marie, Ont.
Swanson Bay Forests, Wood, Pulp & Lumber Mills, Ltd., Swanson, Bay, B.C.
Toronto Paper Mfg. Co., Ltd., Cornwall, Ont.

PAPER MILLS

Bag

Eddy, The E. B. Co., Ltd., Hull, P. Q.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
Ford, J. & Co., Port Neuf.
Wilson, Ltd., J. C., 61 St. Alexander Street, Montreal, Que.
Jonquiere Pulp Co., Jonquiere, Que.

Binders' Board

McArthur. Alex. & Co., Montreal.
Northumberland Paper and Electric Co., Campbellford, Ont.

Blotting

Canada Paper Co., Montreal, Que., "Velvet Blotting."

Board

See Wood Board and Cardboard Specials.

Bond

Canada Paper Co., Ltd., Montreal, Que. "Burmese Bond," "St. Lawrence Bond," "Canada Bond," "Burmese Linen Ledger," "Windsor Mills Special," "Silverstream," "Springvale," "Super Writing," "White Railway," "Railway Manilla."
Howard Smith Paper Mills, Ltd., Montreal & Beauharnois, Que.
Kinleith Paper Co., Ltd., St. Catharines, Ont.
Rolland Paper Co., St. Jerome, Que., Mount Rolland, Que. and Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Book and Litho

Canada Paper Co., Ltd., Montreal, Que. "Art Photo Book," "Tinted Art Book," "Art Chromo," "English Book," "Satin Book," "Satin Litho," "Litho Label," "Super S. C. Book," "Standard S. C. Book," "Windsor Book."
Eddy Co., The E. B. ,Ltd., Hull, Que.
Kinleith Paper Co., Ltd., St. Catharines, Ont.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Box Board

See Wood Board and Cardboard Special.

Dominion Timber Regulations

Licenses to cut timber on Dominion Lands in the Provinces of Manitoba, Saskatchewan, and Alberta, the Northwest Territories, within twenty miles on either side of the main line of the Canadian Pacific Railway in the Province of British Columbia, and in the tract of three and one-half million acres to be located by the Government of the Dominion in the Peace River district in the Province of British Columbia, lying east of the Rocky Mountains and adjoining the Province of Alberta, shall be disposed of by public auction at the office of the Dominion Timber Agent for the district in which the berths are situated.

Before any parcel of timber is offered for sale it shall be surveyed by a duly qualified Dominion Land Surveyor into berths of an area not exceeding twenty-five square miles, and each of such berths shall then be thoroughly cruised by a duly qualified timber cruiser in the employ of the Dominion Government. The Minister shall then fix an upset price at which the berth shall be disposed of, and no berth shall be sold at less than the price so fixed.

Purchases to the amount of one thousand dollars or under shall be paid in cash at the time of sale. Purchases over one thousand dollars and not exceeding five thousand dollars shall be paid, one-half in cash at the time of sale, and a note or notes shall be given for the remaining half of the purchase price, payable in three months, with interest at the rate of five per cent. per annum. Purchases over five thousand dollars and not exceeding ten thousand dollars shall be paid one-third in cash at the time of sale, and notes shall be given for the remaining two-thirds of the purchase price, payable in three and six months, with interest at the rate of five per cent. per annum. Purchases exceeding ten thousand dollars shall be paid one-fourth in cash at the time of sale, and notes shall be given for the remaining three-fourths of the purchase price, payable in three, six and nine months, with interest at the rate of five per cent. per annum. Notes shall be made payable at a bank in the city or town in which the sale is held or at a bank in the city of Ottawa. Cash payments must be made at the time of sale in legal tender or by an accepted cheque on a chartered bank, or by a draft issued by a chartered bank, payable to the order of the Deputy Minister of the Interior. If default is made in any payment required by this section the sale shall be forfeited and void.

The purchaser must also pay the cost or the estimated cost of the survey of the berth before a license is issued.

The licensee shall pay an annual ground rent of five dollars per square mile except for lands situated to the west of Yale, in the Province of British Columbia, in which case the yearly ground rent shall be five cents per acre.

The licensee shall pay the following dues on timber cut on his berth:—

Sawn lumber, 50 cents per thousand feet, board measure.

Railway ties, eight feet long, 1½ cents each.

Railway ties, nine feet long, 1¾ cents each.

Shingle bolts, 25 cents per cord.

And 5 per cent. on the sale of all other products of the berth.

Timber Permits

Yearly permits are granted to settlers, mine operators and others on application to the Dominion Timber Agents, from whom further information can be obtained.

W. W. Cory
Deputy Minister.

Department of the Interior, Ottawa,
December 20th, 1912.

PAPER MILLS---Continued

Bristol

Don Valley Paper Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.
Canada Paper Co., Montreal & Toronto, "King Bristol," "Windsor Bristol," "C. P. S.Tinted Bristol," "Canada Bristol."

Building and Sheathing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que.
British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
Eastern Paper Co., Ltd., St. Basile, Que.
Montreal Paper Co., St. Basil, Que.
Northumberland Paper and Electric Co., Ltd., Montreal.
Riordon Pulp and Paper Co., Ltd., Montreal, Que.
Western Paper Mills, Ltd., Vancouver, B.C.
Jonquiere Pulp Co. Ltd., Jonquiere, Que.
Ford, R. & Son, Port Neuf, Que.
Laurentide Co., Ltd., Grand Mere, Que.
McArthur, Alex. & Co., Montreal, Que.
McLeod Pulp Co., Ltd., Liverpool, N.S.
Walker, J. R. & Co., Montreal, Que.

Cardboard Specials

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Jonquiere Pulp Co., Jonquiere, Que.
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Laurentide Co. Ltd., Canada Life Building, Montreal, Que.

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Western Paper Mills, Ltd., Vancouver, B.C.

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Georgetown Coating Mills, Ltd., Georgetown, Ont.
National Paper Co., Valleyfield, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.

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Provincial Paper Mills Co., Ltd., Toronto, Ont.
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Provincial Paper Mills Co., Ltd., Toronto, Ont.
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Montreal Paper Co., St. Basile, Que.
Northumberland Paper & Electric Co., Ltd., Campbellford.
Western Paper Mills, Ltd., Vancouver, B.C.

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Dominion Paper Co., Montreal, Que.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
McArthur, Alex. & Co., Montreal, Que.
Riordon Pulp and Paper Co., Merritton, Ont.
Strathcona Paper Co., Strathcona, Ont.
Wilson, Ltd., J. C., Montreal, Que.

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Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal.

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Riordon Pulp and Paper Co., Ltd., Montreal, Que.
Strathcona Paper Co., Strathcona, Ont.

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Dominion Paper Co. Ltd., Montreal, Que.
Dryden Timber and Power Co. Ltd., Dryden, Ont.
New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que.

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News

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Belgo-Canadian Pulp and Paper Co., Shawinigan Falls, Que.
Booth, J. R., Ottawa, Ont.
Canada Paper Co., Ltd., Montreal and Toronto, "Canada Brand."
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Ford, Joseph & Co., Port Neuf, Que.
Fort Frances Pulp & Paper Co., Ltd., Fort Frances, Ont.
Jonquiere Pulp Co., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Lake Superior Paper Co., Sault Ste. Marie, Ont.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
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Powell River Co. Ltd., Powell River, B.C.
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Moira Paper Mills, Belleville, Ont.
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Trent Valley Paper Mills, Glenmiller, Ont.

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Ford, Rowland, Port Neuf, Que.
Gore Valley Paper Mills, Dundas, Ont.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Canada Paper Co., Monreal and Toronto.
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Kinleith Paper Co., St. Catherines, Ont.
Rolland Paper Co., Montreal, Que.
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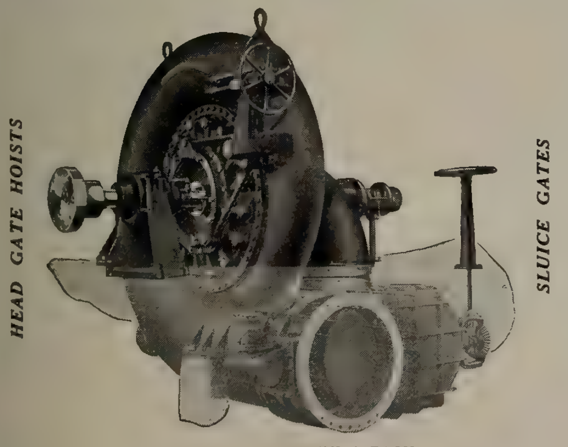

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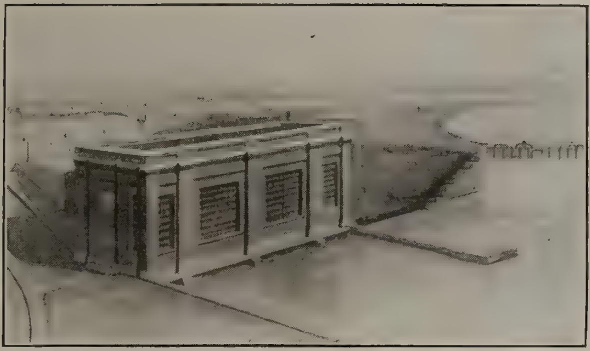

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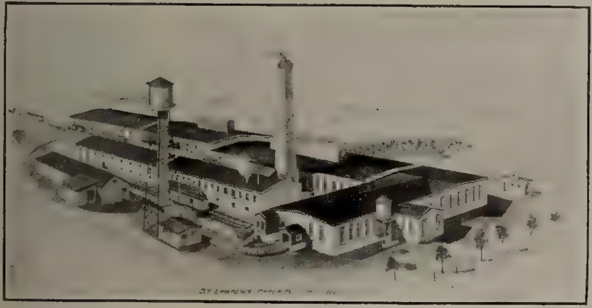

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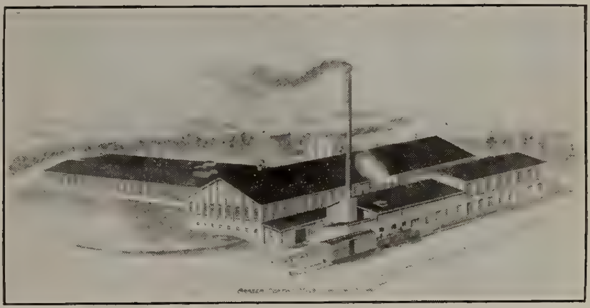

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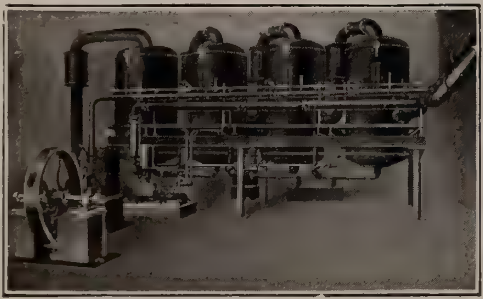

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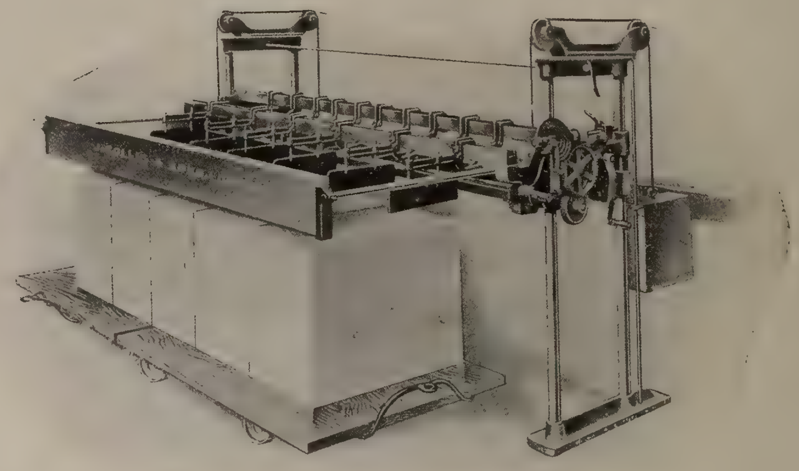

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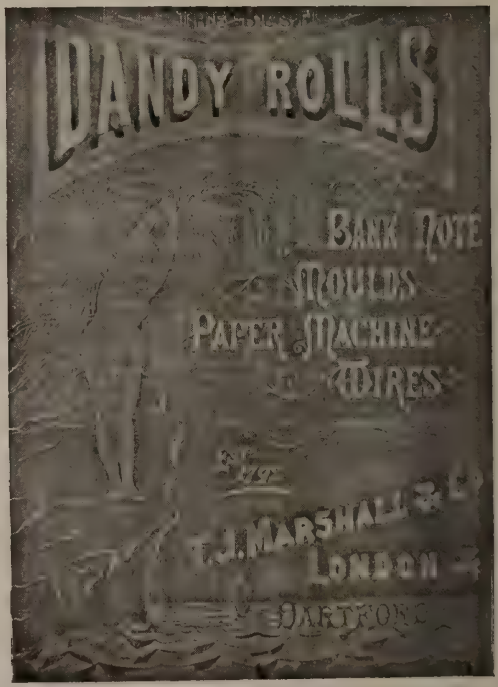

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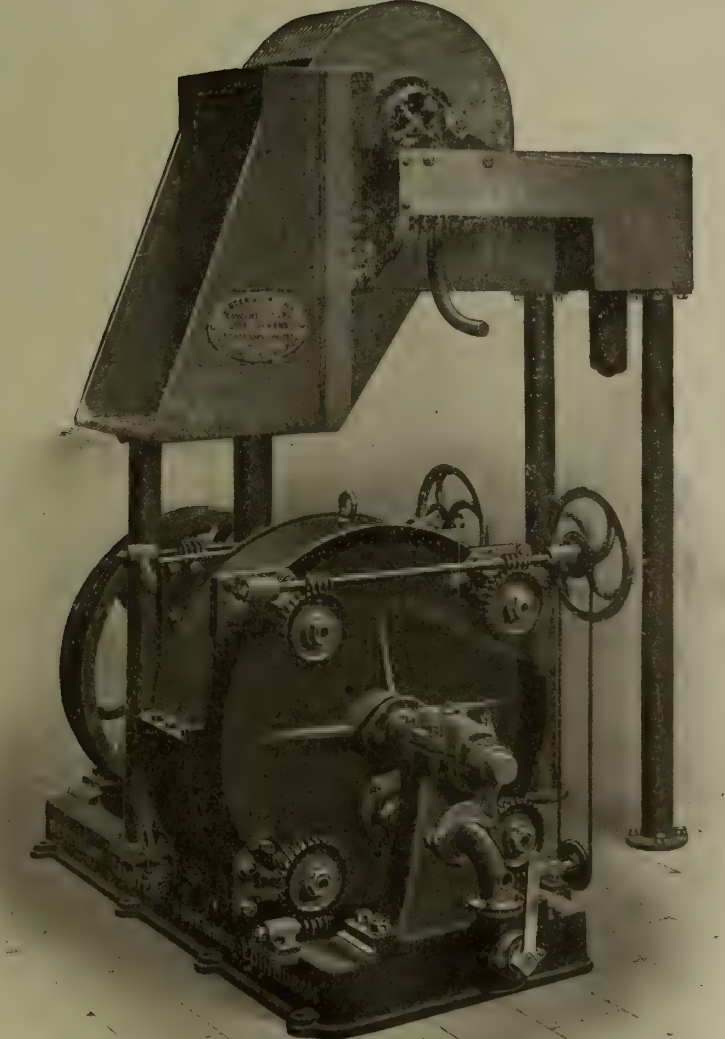

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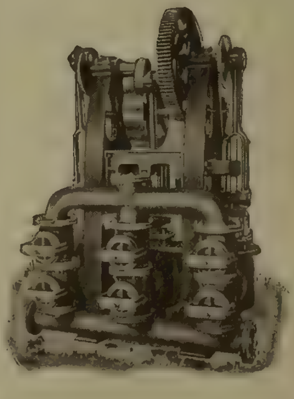

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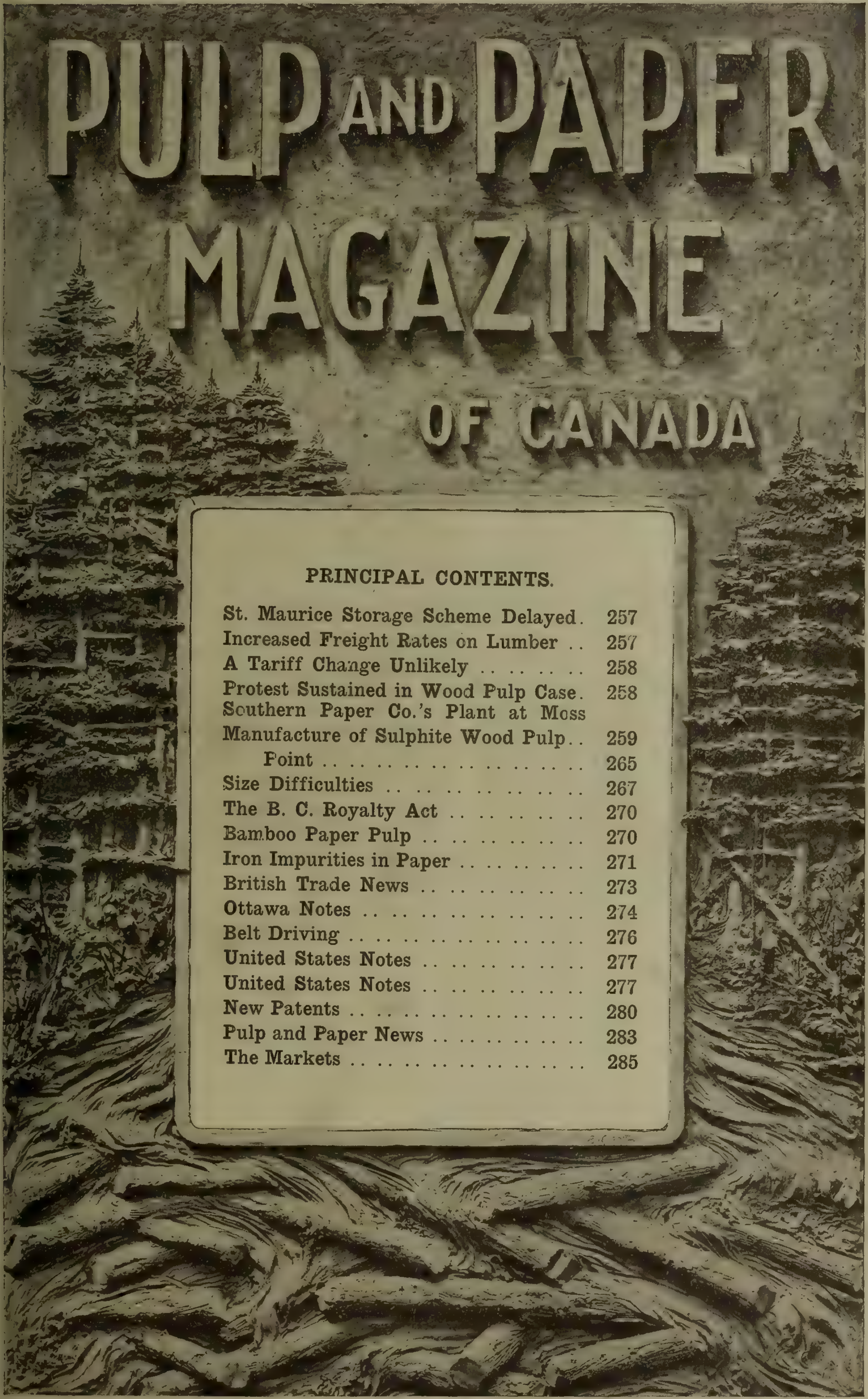

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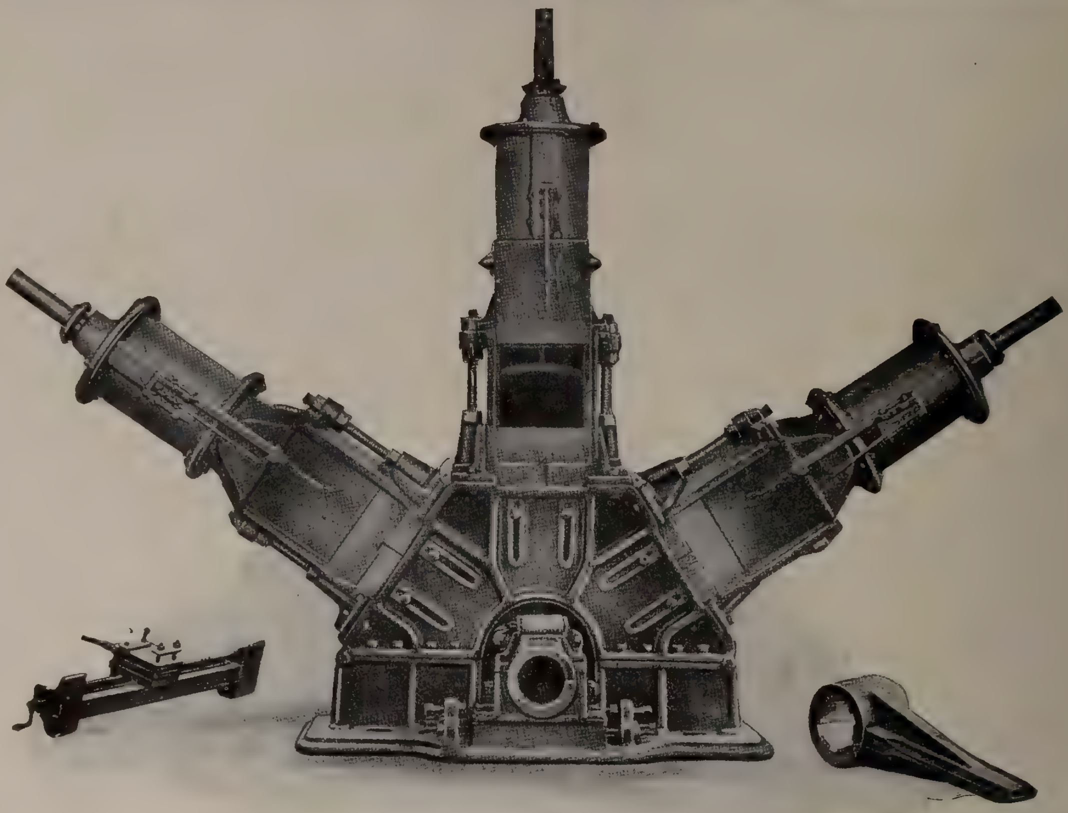

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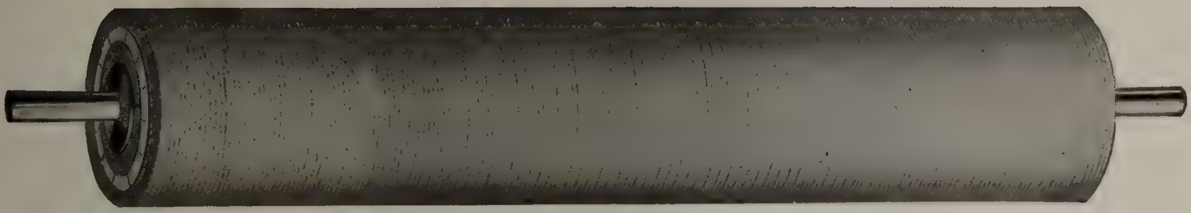

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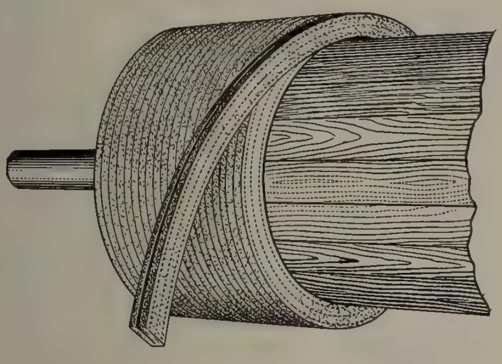

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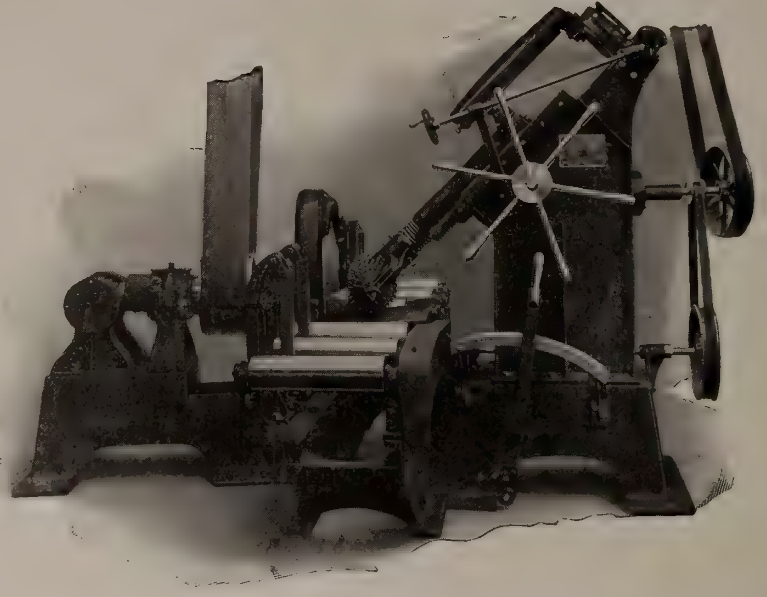

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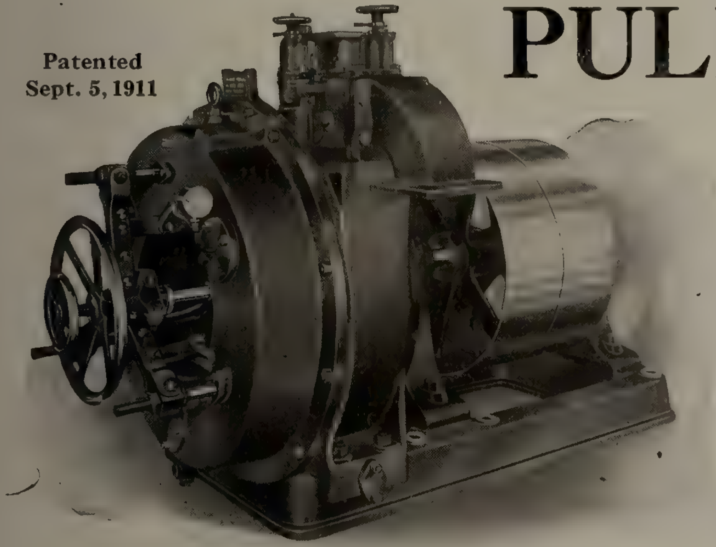

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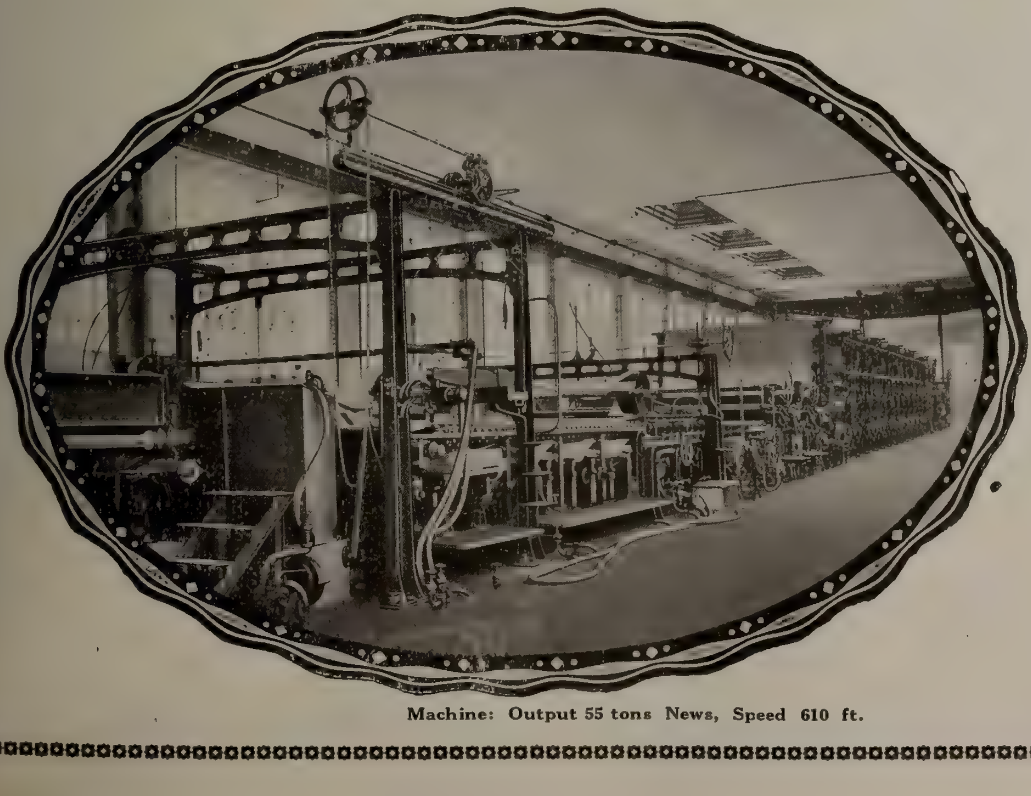

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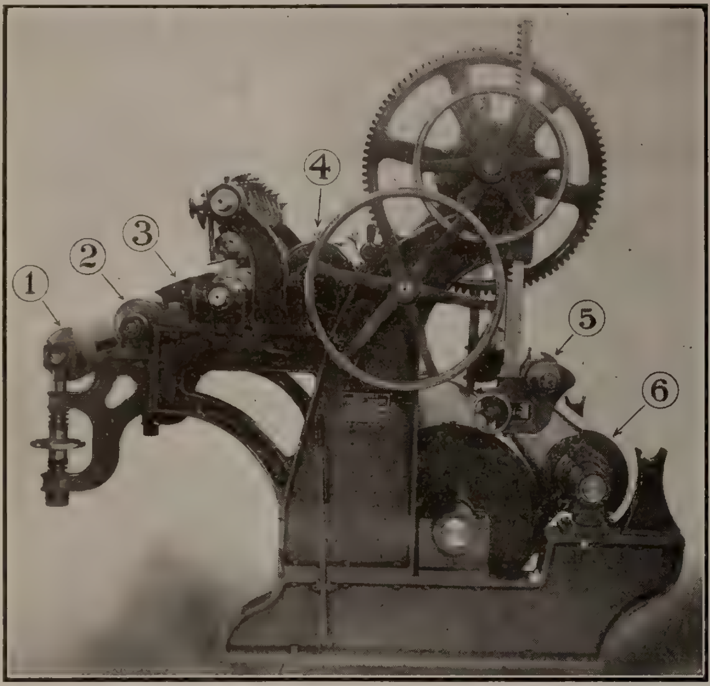

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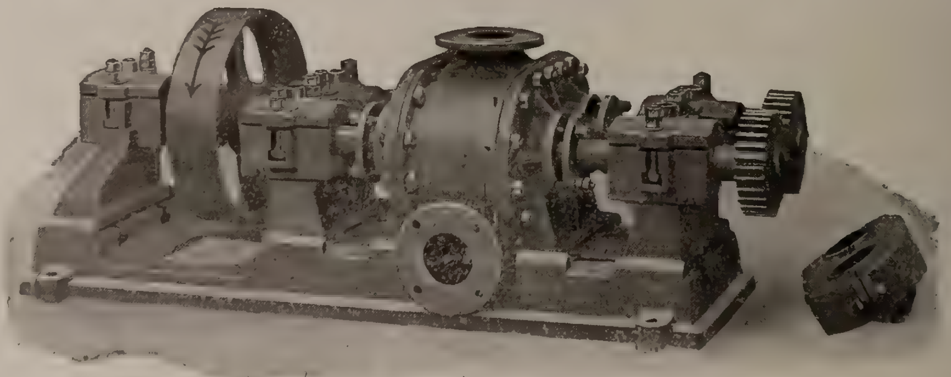

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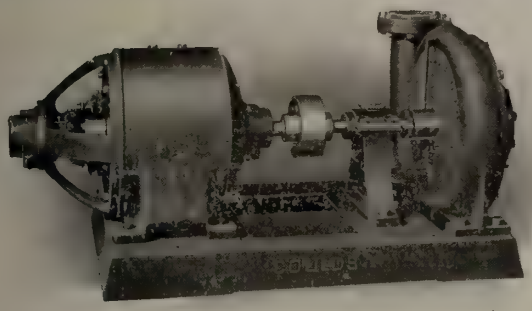

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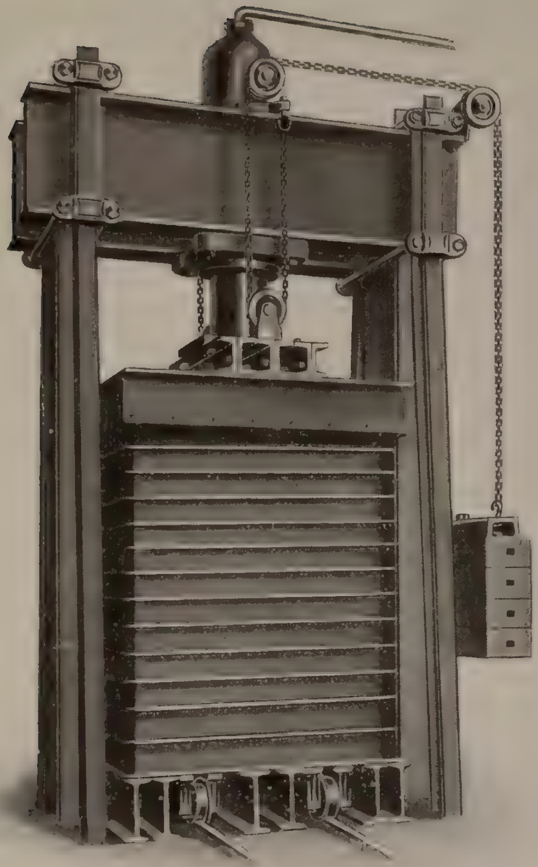

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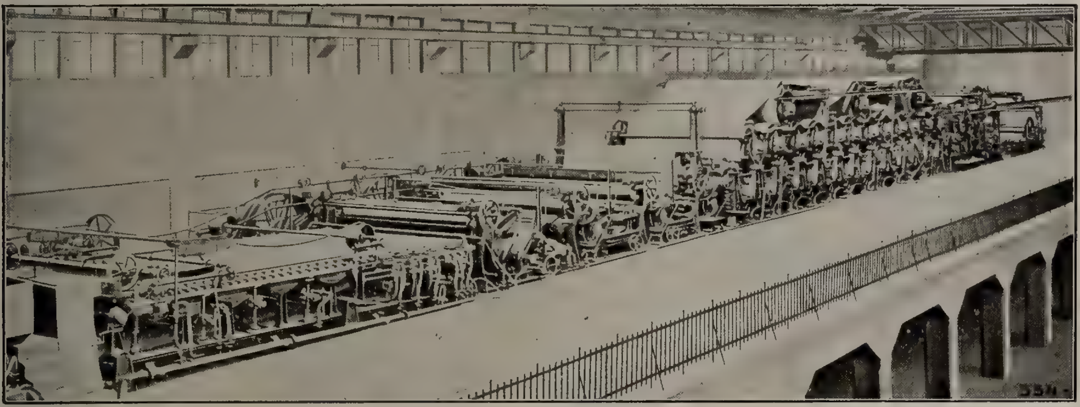

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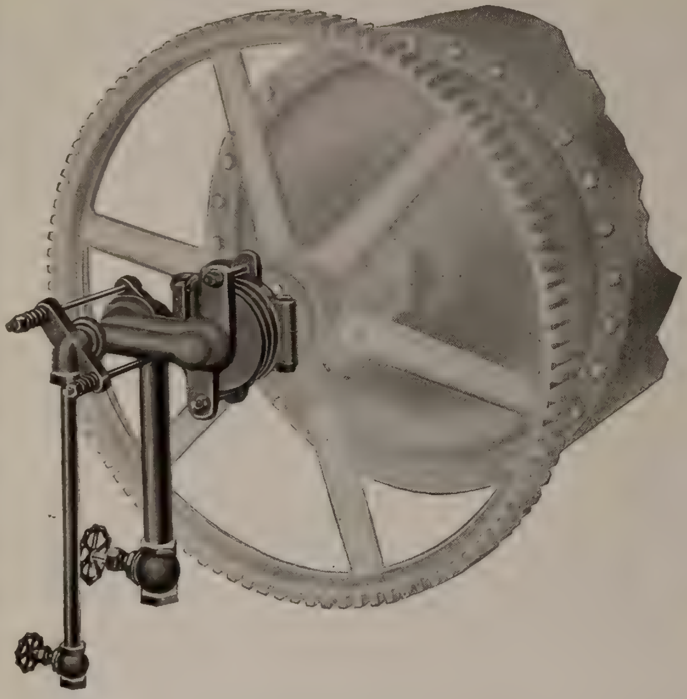

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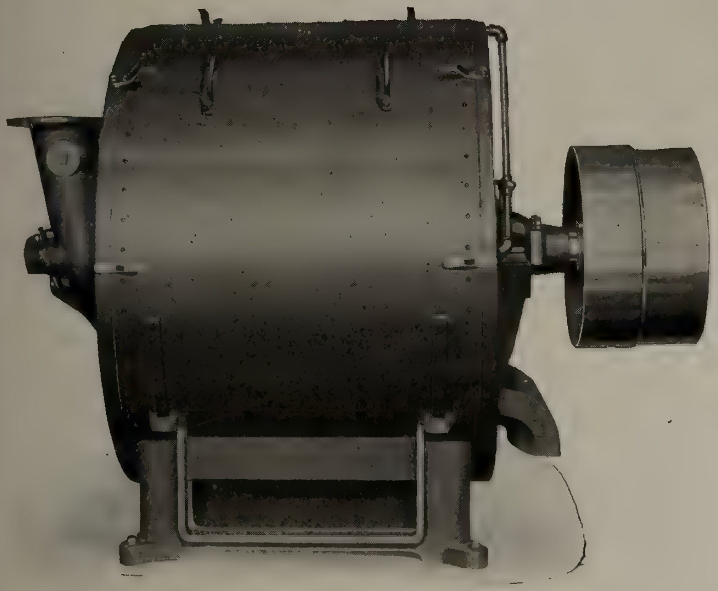

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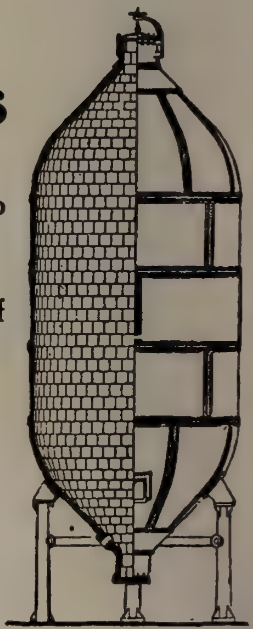

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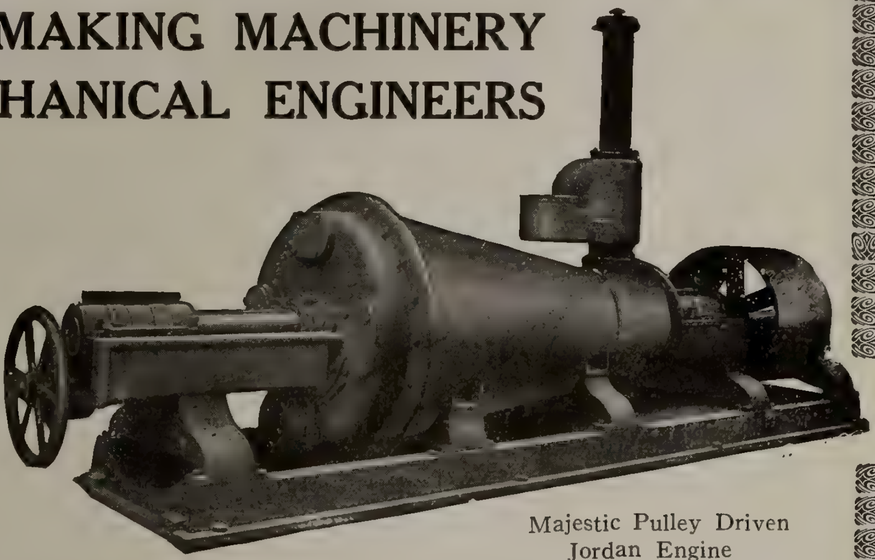

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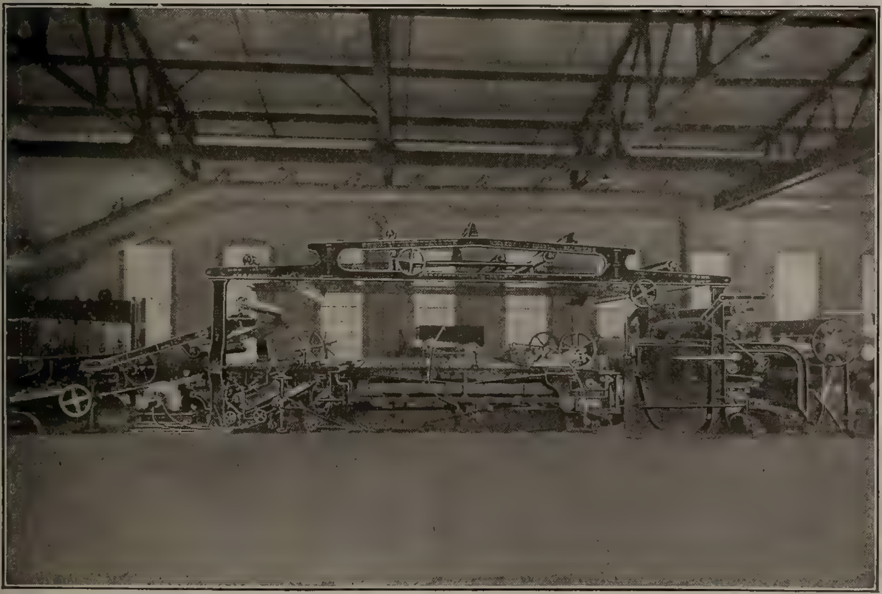

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Pulp and Paper Magazine

A Semi-Monthly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades.

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The St. Maurice Storage Scheme Delayed

It has just been announced that the work on the proposed storage dam on the St. Maurice River has been held up owing to the failure of the companies who will receive benefit from the same to accede to the wishes of the Government in paying a small amount annually as a tax to be held as a sinking fund to overcome the expenses made in connection with the dam. In imposing such a tax on those companies interested, the Government has sufficient precedent to warrant their action. In Ontario, it has been the custom of the Government in carrying out this conservation and storage work to impose a small tax on those industries receiving the benefit, that is, those concerns using the power from the river on which the conservation work has been carried on.

The storage dam on the St. Maurice River will undoubtedly be a great benefit to the pulp and paper concerns and lumbering interests along that and tributary rivers, and in carrying out such a scheme of conservation the Government has had the interests of these concerns in mind. It, therefore, seems reasonable that their objection to the Government's action is rather unwarranted. The country has much need of such conservation work being carried on, and unless those industries effected give their co-operation and assistance, there will undoubtedly be considerable delay in carrying the schemes into effect. It is hoped that the objections raised will be overcome, and that the work on the St. Maurice River will go ahead without delay.

Increased Freight Rates on Lumber

The decision of the Canadian Railways to cancel the summer schedules of tariff on lumber, early in May and maintain the winter schedule all the year round on lumber from Ottawa Valley points to Montreal, is one of very great interest to all branches of the industry in that district. The advance will be a serious thing for the export and domestic trades of Montreal, as well as a disadvantageous factor to the Ottawa lumbermen. The increase proposed, amounts in some instances to one cent per hundred pounds or between thirty and thirty-five cents per thousand feet, and it is thought quite likely that winter rates on paper and pulp will also be maintained.

The reason for this increase is said to be due to the fact that the Ottawa River route to Montreal is practically disregarded at the present time, and for that reason there is no water competition to the railways in that district. This river route was once extensively used by lumbermen and paper manufacturers, but it appears to have lost its prestige as a waterway of commerce. It appears, however, as if the only remedy would be a revival of this means of shipping, so as to provide water competition once more. It is held that if the railways carry out their intentions, it will require the construction of the Georgian Bay Canal to bring the rates down again. It will be to the interest of paper and pulp manufacturers to give this matter their very careful consideration.

A Tariff Change Unlikely

We have heard some talk of late regarding the likelihood of a restoration of the duty on paper going into the United States, in which connection the belief is expressed that the Democratic Administration will not survive the test of the next election. Such action would undoubtedly be a serious matter for many Canadian paper mills. We, however, cannot coincide with these views. In the event of the Republican Party going into power at the next election, it is a question whether they would restore paper duties. The consumption of paper in the United States is far in excess of the domestic production, and the importation of paper from Canada is increasing to a marked extent. Moreover, Canadian mill owners content themselves with knowing that they have means at hand with which to combat such a possibility, which view is upheld by the happenings of recent months. It is, therefore, unlikely that the apprehension of such action has had any serious influence in postponing further developments of the paper industry in Canada There are many other factors exerting an influence on commercial conditions in this country at the present time, which are undoubtedly the reason for the temporary postponement of any pulp and paper proposition that may be on the tapis.

Protest Sustained in Wood Pulp Case

The decision of the Board of General Appraisers in the United States in the duty refund protest case is one of far-reaching effect, and many of the American manufacturers will benefit considerably thereby. There are upwards of 5,000 protests involving refunds, estimated at $3,000,000 of duties collected on Canadian and foreign pulp-wood imported into the United States up until September 19th, 1913.

Under Section 2 of the Reciprocal Act of July 19th, 1911, between Canada and the United States, pulpwood and paper not exceeding 4 cents per pound entered the latter country free of duty. When this act was passed various European nations made inquiry of the Executive Departments of the United States to ascertain what view was going to be taken of the rights of such countries under the favored nation clauses of their treaties with this country. They claimed to be entitled to the same treatment as had been accorded to Canada by statute.

Congress decided, on January 9, 1912, that the determination of the questions raised by such inquiries could better be settled in a court of law than by executive construction, so that the cases came on to be tried by the Board of General Appraisers, whose decision was in favor of the Government. On appeal, the Court of Custom Appeals, on May 12, 1913, reversed the Board and held that the favored nation clause of treaties entitled the countries having such treaties with the United States to free entry of their wood-pulp and paper on the same terms as had been given to Canada and that the Court was given jurisdiction to enforce that right.

The nations which had originally made inquiries concerning the policy of the Government in enforcing the Act of July 26, 1911, renewed, immediately after the decision of the Court of Customs Appeals, their representations, and urged upon the Department acquiescence in the decision as made.

The Government decided on July 28, 1913, to acquiesce in the decision, and since that time the bulk of importations of that character have been liquidated free, and since September 19, 1913, all such importations have been so passed. Also where importations had been before July 28, 1913, liquidated for duty, and the protests on that date were still in the offices of the collectors, the collectors sustained the protests under the instructions of that date, and made refunds accordingly. That is, refunds have already been made upon those protests which were included in the appeals which the Court of Customs Appeals decided, as well as upon protests which were still in collectors' offices on July 28, 1913.

DULL EDGES IN SUPER-CALENDERED PAPER

This unwelcome appearance may be due to several causes. The chief is too fast running of the calender. The best circumferential speed of the rollers with the heavy machines now used is 12 metres per minute, which should not materially be exceeded. Hence the larger the rollers, the slower they must run. Excessive speed of the calender conduces to waste in other ways beside that of the dull edges which have to be cut off, and the faster the calender runs, the deeper the dull edge will be. The paper is much more likely to be torn or damaged in other ways. Besides, a comparatively low rate of speed gives a better lustre, for then every part of the paper is subjected to the friction of the pressure for a longer time. Lastly, the construction of a supercalender is by no means such as makes it fit to be driven except at very moderate speeds, and attempts to increase the output by speeding up will surely result in rapid wear or injury to the machine, in addition to all the other troubles above mentioned.—Zentralblatt.

The Canada Western Lumber Company's profits for 1913 amounted to $984,988. After deducting interest on debenture stock, $420,170; interest on loans, etc., $179,037; debenture stock sinking fund provision, $187,903, and reserve for depreciation $173,293, etc., the amount carried forward is $13,288 To this balance has been added the undivided profits of Dec. 31, 1912, making the total accumulated profits carried forward $696,713.

MANUFACTURE OF SULPHITE WOOD PULP

By G. B. STEFFANSON.

This series of Articles has been prepared at the request of the Editor by Mr. Steffanson to give a comprehensive discussion of the various sulphite processes, chiefly for the benefit of the younger men in the industry.—Editor.

Article I.

Already in 1866 the American chemist B. C. Tilghman patented a process for the manufacture of sulphite wood pulps, and the credit of the invention is undoubtedly due to him.

The reason why he did not succeed in operating his process on a large scale was that although he spent many years of time, and the largest part of his fortune on practical experiments, he thought that the soda pulp industry was too strong a rival of his process, and finally he abandoned it in favor of other inventions of his, which promised larger and quicker returns. The want of a thorough technical knowledge was probably another cause why Tilghman and his assistants did not follow up his inventions.

The credit of having worked on a practical scale an invention for the manufacture of Sulphite wood pulp, made independently of Tilghman or others, is due to the Swedish chemist, C. D. Ekman. During 1873 and 1874 he built the first Sulphite pulp mill in Sweden at Bergvik. This mill was completed in Oct., 1874, and early in 1875 he was able to manufacture sulphite pulp which could be successfully used for paper making and found a ready demand.

Because Ekman kept his inventions a secret until 1881, when he patented it in England and moved over there to build a sulphite pulp mill, the priority for having worked the sulphite pulp process on a practical scale has been claimed by the German Dr. A. Mitscherlich.

Dr. Mitscherlich and his brother started laboratory experiments for the making of sulphite pulp evidently influenced by Tilghman's invention.

In 1874 he patented a method for the manufacture of sulphite pulp, and the following year he was able to start a sulphite pulp mill, but he could not produce an acceptable pulp until 1876. His patent was later annulled when it was proved that Tieghman had been granted a similiar patent previously.

Dr. Mitscherlich can therefore not be considered as the founder of the sulphite pulp industry, as was formerly thought to be the case, but much of the credit of the early development of the industry is undoubtedly due to his energy and perseverance and that of his assistants.

Later inventions such as the German Dr. Kellner, the Swede Flodquist, and others, have only improved different details of the process.

The first sulphite mill in the United States was built in Alpena, Mich., in 1887 under the Dr. Mitscherlich patent. Already in 1885 the first Canadian sulphite pulp mills were built in Cornwall and Merriton, Ont., on the Ritter-Kellner System.

The Woods Used.

On this continent the kinds of woods used in sulphite pulp manufacture are principally White Spruce (Picea Alba), Black Spruce (Picea nigra), Balsam fir (Abies balsamea), Hemlock, (Tsuga Canadensis), to some extent Tamarack or Larch (Larix Americana) which is however nearly extinct, and in the Western States the Cotton wood (Populus Minilifers).

Aspen (Populus tremulaides) and Poplar (Populus alba) have to some extent been used in sulphite pulp manufacture in Europe, but the match factories are now buying this wood at prices which are much higher than the price of other kinds of pulp wood. On this continent these woods are only used in isolated cases for the manufacture of sulphite pulps.

In order to obtain a uniform pulp, it is of great importance that different kinds of wood are not cooked in admixture, as the different incrustations require varying lengths of time for their decomposition. Even the same kind of wood cut on different grounds can produce irregularities in the pulp if cooked together.

White Spruce yields a white pulp free from rosin, but not so very strong.

Black Spruce is more resinous and some care is required in the manufacture from white spruce, but is stronger than the pulp produced from any other kind of wood on this continent.

Balsam Fir contains a large percentage of rosin and care must be taken to remove it in the manufacture. The pulp is of good color but not strong.

Hemlock gives a somewhat coarse dark pulp which is free from rosin and is quite suitable for newsprint and similar papers where a high color is not essential.

Tamarack is resinous but gives a fairly high colored pulp. The fibre is shorter than Spruce fibre.

The Scandinavian Spruce (Pinus sylvestris) yields undoubtedly the strongest fibres of all kinds of wood used in the manufacture of sulphite pulp, but if properly cooked, both white and black spruce should yield a pulp that in strength could compete with the majority of Scandinavian and German brands of Sulphite pulp sold on this continent.

For the production of bleached pulp the wood in this country should be more suitable, because it does not as a rule contain black knots which cause endless trouble in some parts of northern Europe.

The Treatment and Transportation of Wood.

The wood should preferably be cut between the middle of November and the middle of March, as wood cut during this period gives the strongest fibre and does not rot very easily.

If the wood is to be dried, before it is taken out of the bush, and the place where it is piled or left to dry is not open and windy, the bark should be stripped off the log in strips a few inches apart to admit the air to the wood in order to prevent rotting and the growth of fungi.

The wood which is to be peeled should be cut as early as possible while the sap runs as the fibre loses in strength while the sap is running. The bark should be peeled off, and the branches removed only as far as the tree is meant to be cut up for pulp wood, the top being left intact, the tree is now left in this condition for about six weeks before it is finally cut up. While the tree lies thus, the bark, branches and the needles in the top attract the sap, which causes the wood to contract, so that later no cracks are formed in drying, which absorbs dirt, specially in driving in the rivers.

In any case the branches should be carefully removed, large knots take up a lot of room in racking the wood, and cause inaccuracy in measuring and great trouble where the wood has to be rossed. This applies particularly to wood of small dimensions.

The transport of the wood in the forest, in the river, or by rail need not be discussed here, as it is the business of the wood ranger.

The arrangements for the transportation of the wood from the boom or railroad car to the wood room or the pile can be arranged in many different ways. The problem before the engineer is to construct the most economical transportation arrangements, with due regard to location, wages, cost of materials, the demand for uniformly dried wood, etc. The old method of conveying the long logs from the boom or car, by means of an elevated conveyor, to large storage grounds where it is piled in such a manner as to allow the air free access, has many advantages, particularly if high grade pulp is manufactured. The wood is in this case usually taken to the wood room on railway cars.

This system is still very extensively used in European mills, but it can only under certain conditions be considered suitable here in Canada, on account of the higher wages.

It is more economical to take the wood to the slashers first by means of chain conveyors and further to the pile or mill on chain conveyors or water spouts. These conveyors should be so arranged that one high conveyor takes the wood to the piles, and the returning chain, under the pile, takes it to the mill, or so that one conveyor takes the wood to the high conveyor at the pile as well as to the conveyor connecting the pile with the mill.

A suitable of conveyor in the wood room is a wide water spout running along side the barkers and provided with a circulating pump. In cold weather the water in this spout should be warmed so that the wood is thawed out before reaching the barkers.

Preparation of the Wood.

There are three types of cross-cut saws, the balance saw, stationary circular saw, and the band saw.

The balance saw is cheap but has a small capacity, and is out of the question except in small mills.

Stationary circular saws, so arranged that the logs, by means of chains, are carried over a table provided with a number of saws, are cheap in first cost and maintenance, all types of circular saws, however, cause a considerable loss of wood particularly if the wood is of large diameter, when the thickness of the saw requires increasing.

The band saws are also provided with chains which take the logs to and past the saws. Both the ascending and the descending portion of the saw blade are cutting and the length of the cut logs is equal to the diameter of the saw pulleys. This type of saw is the most expensive one, but for large mills it is never the less economical because it causes less loss through saw dust than circular saws.

Disregarding hand barking, there are three methods of barking done by different types of machines, namely the drum barkers, the automatic barkers for long logs and the discbarkers.

The drum barker is the most economical of all barkers, although it is much more expensive than other barkers and requires about 50 per cent more power. It saves all the wood wasted by other machines, which amounts to from 6 to 16 per cent or even more. The drum barker is however suitable only in sulphite mills where clean pulp is not very essential, or where bleached pulp is manufactured and the look of the unbleached pulp is of no consequence. The drum barkers do not remove all the last thin layer of the bark, and it would be too costly to remove it by hand. This thin layer of bark retains a dark color after cooking, and shows up as dark fibres or dirt in the pulp which is however quite as easily bleached as any other part of the pulp. It is to be noted that the water in the drums has to be heated, and this causes extra expense, unless some exhaust steam, which otherwise would be wasted, can be used for the purpose. The attendants required for drum barkers in a large or medium sized mill are less than for other barkers, but as any bark remaining in cracks or round knots must be removed by hand, or for some drum barkers part of the wood sent through twice, the saving in wages is not very large.

Automatic barkers are most suitable for wood of small dimensions, but much attention is necessary, and reliable men should work the machines to keep down the loss of wood. It may be remarked here that these machines are usually built for the barking of logs before they are cut up into lengths fit to handle.

The most common barking machines are the disc barkers of which there are several types. The usual type with four radial knives wastes a considerable proportion of good wood, because the operator turns the log by hand, and when he changes the position of his hands the knives cut over a portion of the log which has already been barked. Wood which has been barked on such a machine is easily recognized by the angular surface which it presents.

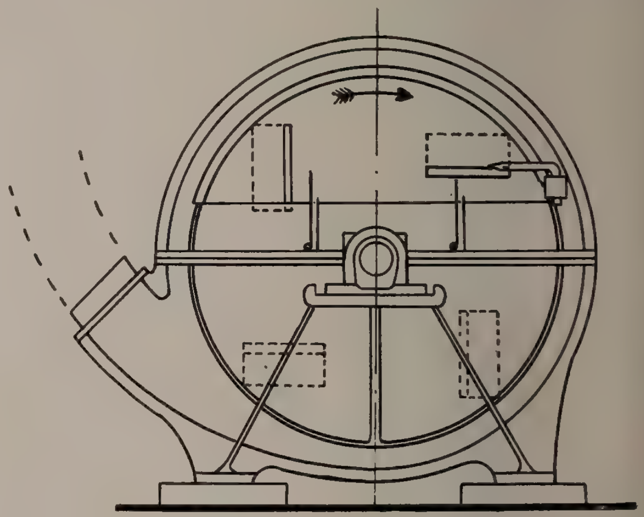


FIG. I.

In order to prevent this waste, barking attachments have been designed. They bark the wood more uniformly, but in order to give the machine capacity, the knives must be set to project 1-16 in. or more, which also causes great loss of wood.

Undoubtedly the most economical disc barker is the machine which was introduced in most of the Scandinavian mills about 15 years ago. In this machine the knives are parellel with the diameter of the disc and not radial (see figure 1). The wood is supported on adjustable blunt edged supports placed at right angles to the disc, and to prevent a longitudinal motion of the log, one end of it rests against a swivel point or a ball. The knives touch the log tangentially and cause it to rotate. All the operator has to do is to keep the log against the disc and prevent it from rotating too fast. These machines have a greater capacity than any other type of disc barking machines, as no time is wasted in turning the logs or manipulation of barking attachments. The knives need not and should not project more than 1-32 in., in order to save wood.

In barking wood with all the bark on, the losses in using the different machines are approximately as follows:

Drum barkers 10 per cent.
Automatic barkers 15 to 35 per cent.
Disc barkers with attachment and radial knives 20 to 30 per cent.
Disc barkers with knives parallel to the diameter of the disc 15 to 20 per cent.

The bark is about 9 per cent of the total wood, the remainder being loss of useful wood. In barking wood which has lost the greatest part of the bark in driving, the loss of wood is higher.

In a well arranged wood room, the logs should be conveyed as close to the barker as possible, so that the operator can easily reach them, and there should always be an ample supply of wood at hand. Cross conveyors operated by the barker man are apt to cause considerable waste of time.

The conveyors from the barkers to the chippers should be arranged so that the logs need not be lifted from the barkers but can be allowed to slide on to the conveyor. If possible these conveyors should be arranged on the floor below the barkers and they should be of the chain or belt type, and feed the wood into the chipper spout, so that the chipper man can give most of his attention to the chipper, which is of very great importance.

The barking machines should be provided with fans, cast in one piece with the disc for blowing the bark into the boiler house, or to a waste-conveyor. The machines should be able to blow the bark to cyclone separators in the boiler house, unless the distance is greater than about 600 feet, provided there are no sharp turns in the pipes. In case of greater distance, a covered conveyor into which the bark is blown must be used. All the bends in the pipes should be of as big radius as possible, and the bark should be blown into the conveyor, in a direction coinciding, as nearly as possible, with the direction of motion of the conveyor.

The barkers should be driven individually, either by motors or from counter shafts. In the latter case the countershaft should have a tight and a loose pulley against the main shaft, so that any one machine may be stopped without stopping them all, and without having the barker belt running during knife changing. In a large mill this arrangement saves time, and one man can be made responsible for the correct setting for all the knives. When the barkers work on individual piece work, this arrangement is particularly satisfactory, especially when all the barkers take their wood from the same conveyor. The knife grinder then changes the knives in all the barkers in turn at fixed intervals, and the men moved from one machine to another are thus all supplied with wood at the same rate.

The disc chipper is now used almost exclusively: in a few old mills in Germany circular saws are still employed, but the guillotine chipper is no longer used. There are a few different types of disc chippers. The number of knives is usually two or three, arranged radially. The spout may be parallel to the shaft and inclined against the disc, or inclined against both the shafts and the disc. The discs are made either of c. i. or cast steel. Of these the more expensive machines with cast steel discs, two radial knives, and a spout inclined against the disc and the shaft, are preferable. Cast steel discs do not crack as easily as c. i. discs do thereby risk of life and stoppage is diminished. Th inclined spout makes for economy of power, as the plan of the cut is at a more acute angle to the fibre in th wood.

Two knives have been found to be quite sufficien in most cases. The knives should be set to work as nearly parallel to the plane of the cut as possible. By this means the chips are broken up better, which is of special importance where no disintegrators are employed. Frequently, chippers with a fan combined are employed, and in such cases the chips are blown to the disintegrators or chip screens. The cost of maintenance of such chipper arrangements is low, but they require more power than other chippers.

It is bad policy to judge a chipper by its capacity alone, because if the chipper is heavy enough there is practically no limit to its output, but the quality of the chips suffers accordingly. The speed of a chipper should never be greater than to allow the logs to fall against the disc between the cuts, in the case of higher speed the losses through "sawdust" are considerable, and the chips become uneven.

Unless the chipperman's time is occupied with carrying wood, he has plenty of time to see that the logs enter the spout properly, and to keep them from jumping in the spout, which causes uneven chips and the production of a great quantity of long slivers and sawdust. In cold weather the logs should be properly thawed before going into the chipper, in order to obtain uniform chips. For this purpose a thawing tank should be arranged, preferably in connection with the above mentioned water spout conveyor.

The working of the chipper can be judged, apart from the appearance of the chips, from the amount of sawdust obtained from the fine chip screens. This should not exceed 3 per cent.

Another important factor in obtaining uniform chips is the condition of the bed knives in the spouts, which should never be blunt. This point is very often neglected, particularly in old mills where the chippers are of such a design that the changing of these knives is a lengthy and expensive proceeding. This is however easily remedied by fitting the machine with a modern spout, as supplied with up-to-date chippers, where the bed knives can be taken out and regulated from the back side of the spout.

The chipper should stand on a perfectly rigid foundation, but the bed plate of the machine should rest on a layer of hard tough wood, or specially prepared liner felt. This is necessary in order to diminish the vibration, and modifies the risk of bursting of the disc, and generally prolongs the life of the machine.

Where c. i. discs are employed, it is advisable to carefully shrink stout steel rings on the circumfenerce of the disc, in order to prevent it from bursting completely in case it should crack, which happens frequently on account of the uneven heating they are subject to.

There are four distinct types of disintegrators: the coffee mill type, Can's disintegrator, the Lombard type and the tooth crusher type.

The first type is very similar to the old coffee mill. It requires little power and is the only adjustable disintegrator, but its capacity is comparatively small, and it requires more space and is more costly to install than the other types.

Can's disintegrator consists of two or more discs on a horizontal shaft running inside a housing. The discs are provided with two or more rows of pins fastened to their sides, and these pins run between rows of pins fastened to the housing. The other end of the pins should be joined by steel rings, to prevent them from bending, unless the whole machine is made of cast steel. This disintegrator is most commonly used; it requires more power than other types, but it is cheaper at first cost and up-keep. The machine should be placed on a firm but tough foundation.

Lombard's disintegrator is similar in construction to Can's but the chips are broken up by means of movable arms. This machine requires somewhat less power than Can's but is less effective. The first cost of a Lombard machine is considerable and it is expensive in up-keep.

The tooth-crusher is of a later design. This disintegrator seems to find a growing market on this continent.

All the disintegrators reduce more or less of the chips to saw-dust, but where the chips are to be screened on coarse screens they can not be dispensed with, unless the chippers break up the chips thoroughly. Where it can be arranged the disintegrator should deliver direct into the chip screen, in order to avoid using a conveyor.

There are two types of chip screens, flat shaking screens and rotary screens. Where the screens can be arranged on a solid foundation, the cheaper flat screens are to be preferred. If the screens have to be arranged on a top floor, or on wood structures rotary screens are the better type.

The flat screen should be inclined about 10° and they are usually made double, the top one being coarse, and the lower one a fine screen. Conveyors are arranged to remove sticks and knots, sawdust and chips, to the rechipper, boiler house, and chip bins respectively.

The cheapest screen plates as regards upkeep are perforated sheet steel plates, but they have a much smaller capacity than wire screens. For longer chips (1¼ in. and longer) a wire screen with rectangular meshes is preferable for coarse screening. A suitable wire for this purpose is made with ¼ or 3-16 in. wire for warp, and 3-32 in. for weft. The weft is wound round the warp for a distance equal to the width of the meshes. The warp wires are 6 to 7 ins. apart, and the distance between the wefts varies with the chips from ½ to 1 in. The holes in the perforated plate should be of a diameter 3-8 to ½ in. larger than the length of the chips. The fine screens should have perforations not larger than 3-8 to 7-16 in. in diameter. Ordinary steel wire, with ¼ in. mesh, is suitable for fine screens, and inexpensive, although it has to be changed frequently

A good way of utilising the screenings is to arrange two fine screens, one with not over ¼ in. mesh, and the second with ½ in. mesh. The fine saw-dust is burnt, but the coarser sawdust mostly consisting of chips broken too much by the disintegrator, is collected in separate bins and cooked separately. These fine chips take more space, so that the out-put of the digesters will be diminished, but they can be cooked with weaker acid, and gives a very clean pulp.

The rotary chip screens can be arranged consecutively in one length supported on rollers. It is however cheaper in upkeep to arrange them separately in steps, and with through going shafts, although they occupy a larger space when arranged in this manner.

There are many types of re-chippers, of which a miniature wood chipper is the best from many points of view. They all produce an inferior quality of chips, however, and the sticks and knots would probably be burnt to better advantage, especially in Canada where wood is generally cheap and coal is expensive.

The chips should be taken to the bins by means of bucket conveyors instead of fans. The latter produce large quantities of dust or wood-flour, which in cooking consumes acid without yielding any pulp, and sometimes this dust appears in the pulp, uncooked, in the form of specks.

The lengths of the chips depends on the method of cooking employed. For Mitscherlich unbleachable pulp, the chips should be 1¼ to 1¾ ins., for ordinary news print or "quickly cooked" pulp, ¾ to 1 in., and for unbleachable pulp ⅝ to ¾ in. long.

In many mills the cost of the preparation of the wood is kept down to such an extent that the quality of the chips suffers considerably, quite regardless of the fact that much more can be gained by less waste in the wood room, not to speak of the better price obtained for cleaner pulp. The greatest part of the dirt in the pulp is undoubtedly due to the faulty treatment of the wood, not only in the barking, but still more in the chipping and screening.

In preparing the wood the production of uniform chips, both as regards size, and their being free from dust, large sticks and knots, is of the greatest importance. The pulp produced from uniform clean chips is strong, uniform and clean. Slivers and dirt once in the pulp are very difficult to remove completely.

The yield from uniform chips is much greater.

Where different kinds of wood are used, it is of great importance to cook them separately. The incrustations in the different kinds of woods are not very different, as far as the modern research work has shown, but they are present in different quantities, and react with varying rapidity with the acid. In several European mills, wood from trees of the same kind grown on a rocky, and on a fertile soil are cooked separately, in order to avoid an uneven pulp, but this is of little or no importance when the wood is not properly seasoned, and thus shows varying absorption of acid.

The amount of wood used per ton of pulp produced varies considerably, and this factor of the manufacture is often capable of being considerably improved. Many mills used as much as 2, or even 2¼ cords of wood per ton of pulp.

With medium quality of rough seasoned wood, the quantity required for strong Mitscherlich pulp, should not exceed 1.65 to 1.70 cords, for ordinary "quickly cooked" pulp 1.80 cords, and for bleachable pulp 1.9 cords per ton of 2,000 lbs. It is to be noticed, however, that the better utilization of the wood means, as a rule, a slightly increased cost of labor. In many cases the increased yield of pulp is worth many times the increased cost of manufacture, but often the installation of the most suitable machines, and the proper supervision of the wood room, wipes out any difference in the cost of preparing the wood, and sometimes even lowers this cost.

It is hardly possible without going into many details to give figures of the capacity of the different wood preparing machines. An idea of how far the different types of machines may be forced economically, is given here on the assumption that the wood comes to the mill in lengths of 20 feet, or in shorter lengths divisible into lengths of 2½ ft. and that the wood is cut up into length of 2½ ft. and is of medium size and quality, with regard to straightness knots, etc.

A balance saw can cut 6 cords per hour while stationary circular saws and band saws will handle as much as 50 cords an hour.

The drum barker cleans about one cord per hour. The capacity of automatic barkers depends entirely on the speed with which they are fed, and the barking arrangement, but generally speaking they have no greater capacity than an ordinary disc barker.

A disk barker with radial knives, and fitted with a barking attachment, should have a capacity of from 1.2 to 1.4 cords per hour, and a disc barker with the knives parallel to the diameter, should have a capacity of 1.5 to 1.7 cords per hour.

A chipper with two knives, making long chips, should run 175 to 200 R. P. M., and 225 R. P. M. for shorter chips.

If the chips should be uneven in spite of the machine being properly fed, the speed must be decreased until the desired result is obtained.

There are chippers on the market guaranteed to cut 15 cords per hour, but it is not advisable to calculate for more than 10 cords per hour, even with the largest machines, if uniform chips are desired.

The capacity of the disintegrators depends on the length of the chips and the size of the machine. It is advisable to have one disintegrator for each chipper. Coffee mill type disintegrators of a sufficient capacity for large chippers are however hardly to be found.

When different lengths of chips, or different kinds of wood are chipped, the speed of the disintegrator should be variable, except in the case of the coffee mill disintegrator which can be otherwise adjusted.

The capacity of chip screens is usually taken to be 1-10 of a cord per square ft. per hour, but this capacity can be very much exceeded, although the quality of the chips suffers accordingly.

Rotary screens have a somewhat larger output per square ft. than shaking screens.

The best arrangement is to have one chip screen for each chipper.

Preparation of the Acid.

The acid used in the aqueous solution of calcium or magnesium bisulphite, containing a large portion of free sulphur dioxide. $[(Ca\ Mg)\ (HSO_3)_2+2—H_2\ SO_3 +NH_2O]$

It is prepared from sulphur (S) or iron pyrites ($Fe\ S_2$), and limestone or dolomite ($Ca\ CO_3$ or $Mg\ CO_3$) or burnt lime or magnesia (CaO or MgO).

The acid making comprises four different operations viz: the burning of the sulphur or pyrites for obtaining the sulphur dioxide (SO_2), the charging of the limestone or the slaking of the quick lime, the acid making proper by combining the two products and water, and the recovery of the SO_2 which last operation is intimately connected with the cooking.

The acid making plant consists of the following parts: sulphur or pyrite burners, gas washers and coolers, the acid making apparatus, coolers for recovered gas, and storage tanks.

There are two main types of sulphur burners, the old retort, and the newer rotary burner. The retorts can be used with advantage when pure sulphur (99 per cent or more) is burned, especially if Silician sulphur is used and the retorts are fitted with melting pots for sulphur on top, from the which the sulphur runs down This is done in order to prevent an excess of air in the retort, and in order to dry the sulphur which later will be more fully discussed later.

It is very important that the admission of air into the burner can be regulated accurately, and that hot secondary air can be admitted, in such a manner that it is thoroughly mixed with the gas from the burner, in the combustion chamber, at the back of the burner.

The rotary sulphur burners can be used with advantage for burning impure sulphur, or sulphur liable to form an oily skin on the top of the melted mass. The impure sulphur should however be avoided, unless it can be obtained at a very low price per unit of pure sulphur. When burning low grade material, the burners have to be frequently cleaned, and this causes interruptions and increased cost of working them. Freight and handling has also to be paid for material which is of no use in acid making, where low grade sulphur is used.

The rotary burners can not conveniently be fitted with melting pot, but there are other kinds of automatic feeds. Attention should be paid to the proper regulation and admission of air, and hot secondary air, as mentioned above.

The old type of pyrite burners with moveable grates has now gone out of existence almost completely, partly on account of the high cost of working these burners, and partly because of the waste of materials in crushing the pyrites to suitable size; the main difficulty with this burner is that the cinders still contain about 4 per cent or more of sulphur, which makes them unfit for iron manufacture.

The most commonly used pyrite burner is the Herreshoff burner, which is a cylindrical vertical shelf burner, made of acid proof and fire proof brick with a sheet iron shell. There are usually five shelves in the burner, and arms, and carried by a vertical air cooled shaft, rake the materials from one shelf to the next one.

A dryer made of sheet iron of the same construction as the shelves in the burner, and forming the top of the burner, should be fitted in order to prevent the pyrites entering the burner in a moist state. Otherwise wasted hot air from the burner is used for ths purpose.

The pyrites should be fed automatically to the dryer and from there into another adjustable automatic feed arangement on the burner.

When starting up the burner has to be heated up by means of coal or wood, and the pyrites are fed into the burner. The burners should be fed at such a rate that the heat obtained by the burning pyrites is sufficient to remove the sulphur, but not in larger quantities than to permit the cinders leaving the furnace, so cooled by the entering air that they do not show signs of glowing. The sulphur in pyrites which contain no other metals than iron, can be nearly completely burnt off, only one per cent. or less remaining Any sulphur combined with copper or tin in the pyrites can not be burned off

Pure Pyrites ($Fe\ S_2$) contain about 53 per cent sulphur but the commercial article only contains from 35 to 50 per cent.

In calculations on the use of pyrites, great care is necessary in order to avoid mistakes, because pyrites cost so much more than sulphur in handling, and the burner plant cost many times more than a sulphur burner plant. Some kinds of pyrites also contain minerals like Selenium, which causes serious trouble in the cooking, even when present in minute quantities.

If the pyrites can be delivered at the mill containing about 45 per cent of sulphur, or not less than 40 per cent. of available sulphur, at a price per unit of sulphur in the pyrites amounting to about 60 per cent of the price of pure sulphur, it is generally good economy to use pyrites.

The washing and cooling of the gas is of particular importance when pyrites are used. The best arrangement is to conduct the gas through large vertical leadlined pipes or towers which are provided with water sprinklers, which partly serve to remove the fine irone ore dust from the gas and also to keep the lead lining cool, as well as to some extent to cool the gas.

The wash water should be discharged at a temperature not less than 175° F., because at lower temperatures the water will retain SO_2 which will then be lost. It is best to arrange one washing system for each two Herreshoff burners. The gas is usually drawn through the burners and forced through washer and cooler into the acid making apparatus, by means of a fan, these fans are best made of phosphor bronze, and fitted with water cooled bearings.

There are several types of gas coolers. Where a lead burner is employed, gas coolers can easily be made at the mill. The most suitable type of coolers are high rectangular horizontal lead pipes, stayed internally with lead pipes, and of such dimensions that the gas passes slowly through them. The stay pipes also serve the purpose of forcing the largest part of the gases to touch the sides of the water cooled pipes, and are in themselves good coolers if not placed horizontally, as the cooling water passes through them quickly. The whole arrangement is placed in a tank supplied with cooling water, the flow of which is arranged on the countercurrent principle.

There are several types of coolers on the market which give very satisfactory results, but they are all very expensive.

The ordinary type of cooler, consisting of a great number of 8 or 10 in. lead pipe, arranged successively or in series in a water tank, is unsatisfactory, on account of the fact that the gas passes through too quickly, or in the case of a sectional arrangement of the pipes, it passes through only a part of the section, and thus the cooling surface is not properly utilized.

The coolers should be easily accessible for cleaning and repairs.

When pyrites are burnt, the cooling surface should be about 15 square ft. per ton of daily production, and about this amount of sulphur burners are used.

In summertime the gas should be cooled to nearly the same temperature as the cooling water before being admitted into the acid making apparatus. In winter time the cooling should be so adjusted that the temperature of the acid does not fall below 55° F. This is particularly important in connection with some of the limestone acid making systems, in order to keep the composition of the acid uniform all the year round.

The water obtained from these coolers, and the reclaiming coolers, can be used for diluting or washing the pulp as long as it is free from acid.

As above mentioned there are two distinct systems of acid making, the limestone systems and the milk of lime systems.

Of the former system there are four modifications employing high towers, low towers, tanks or chambers.

The milk of lime system consists of tank or low towers, but the chamber systems were in early days also used as a milk of lime system.

The merits of the different systems can only be judged in connection with each individual mill. As a rule the milk of lime systems are the most costly in running expense, on account of the cost of burning the lime, but where the freight rates for lime and limestone are high, it must be considered whether the higher freight charges for the limestone, which is about 80 per cent heavier than the corresponding quantity of quick lime, would not pay for the burning of the lime at the quarry.

It was formerly thought that dolomite ($Mg\ CO_3$) gave a better and whiter pulp than limestone ($Ca\ CO_3$) whether burnt or unburnt, but this is not the case, as far as the limestone systems are concerned.

An equally strong and white pulp can be made by using limestone ($Ca\ CO_3$) as by using milk of lime, but it is not possible to obtain a high quality of pulp with the milk of lime system, unless the lime contains about 33 per cent of magnesia (MgO).

Generally speaking it is of little importance for the composition of the acid, whether limestone or dolomite, a combination of ($Ca\ CO_3$ and $Mg\ CO_3$) is employed.

(To be continued)

QUEBEC LUMBER EXPORT LAWS.

The Quebec Government, through the Department of Crown Lands, has taken steps to prevent the wholesale exportation of lumber to foreign countries by corporations which have been granted timber lands as subsidies by the Government.

Article 13 of the Woods and Forests regulations, passed by order-in-council in April, 1910, will apply for all Crown Lands given as subsidies to railway companies, to wit:

"The timber cut on such lands must be manufactured in Canada; that is to say, converted into pulp or paper, deals or boards, or into any article of trade or merchandise of which the said timber is only the raw material."

The article goes on to explain that timber, properly squared or made into ties, will be considered as manufactured, but that roughly trimmed lumber will not.

Sales of Crown Lands.

The Minister of Crown Lands will sell by auction on the 11th of August next timber limits in the regions of Ottawa lakes, St. John, Rimouski, Matane, Bonaventure, and Gaspe. Some limits offered have an area of over 2,000 square miles.

Timber limits along the Mistassibi, Ashapmouchouan, and Rat Rivers will be sold by auction by the minister of Crown Lands on October 20th next.

A new condition is imposed on the limit holders, who will henceforward be obliged within three years to manufacture pulp paper in the proportion of five tons per day for every hundred miles of limits.

SOUTHERN PAPER COMPANY'S PLANT AT MOSS POINT, MISS.

"KRAFT" MADE FROM REFUSE OF NEAR-BY SAWMILLS. RECOVERY OF CHEMICALS MAKES PROCESS A COMMERCIAL POSSIBILITY.

The mill of the Southern Paper Company is the first development in American countries of the researches and inventions of Carl P. Carlson, the eminent Swedish chemical engineer whose recovery system made the now famous Kraft papers a commercial possibility. Mr. Carlson was for many years known throughout European paper trades as the foremost fibre chemist in Sweden, and was the designer of upwards of twenty-five successful mills in that country, Norway and Finland for the manufacture of sulphite fibre.

--Photograph, courtesy of International Process Co. New York..

PLANT OF SOUTHERN PAPER CO.

The International Process Company, of New York and London was formed to exploit the Carlson patents in America. With Mr. Carlson as consulting chemist, Mr. A. W. Wern, formerly with Mr. Carlson in the design of the Carlson apparatus, and the operator of the Swedish mills as mechanical engineer, Mr. Joseph H. Wallace, of New York, as consulting engineer, and Mr. E. M. Sawtelle, formerly of the Westinghouse Electric and Manufacturing Company, as general manager. This company has developed apparatus for taking either saw mill waste as raw material and producing a superior grade of paper suitable for a great variety of commercial uses, incidentally recovering 85 per cent. of all chemicals for refuse in its own plant; and finally in reclaiming turpentine, alcohol and other by-products from the incrusting matter.

The Southern Paper Company was organized in 1912 largely through the efforts of Mr. J. L. Dantzler, secretary of the L. N. Dantzler Lumber Company. The plant was erected something more than a year ago, and it was last June that the first paper was made.

The refuse from the various saw mills of Moss Point and near by towns, principally slabs, that were for many years burned in tremendous quantities, are now cut in lengths of four feet, loaded on barges which are towed to the plant of this company and unloaded to a storage pile served by a conveyor on a trestle 900 feet long and 60 feet high.

From this pile the material is delivered by the conveyor as required to a wood preparing building, where the wood is reduced to chips. These are sorted and screened free from sawdust and bark, which are burned as fuel. The uniform chips are carried on a belt conveyor to the top of the digester building, the upper portion of which forms an immense bin for storage of chips prepared for the manufacture of fibre.

The digestors are located in the tallest portion of the building. They are of the tumbling barrel type of welded steel, nine feet in diameter and twenty eight feet long with conical ends arranged to revolve on trunnions, which admit superheated steam while in motion.

The digestors are filled by gravity from the chip bin. The cooking liquor is then added, also by gravity and after the cover is bolted on steam is admitted, and the revolutions of the digester begins. The action of the liquor is chiefly solvent, the resinous matters being taken from the cellulose and drawn off and washed out in the diffusers, which occupy the building adjacent to the digester house. From the diffusers the pulp now thoroughly washed is dumped to a chest from which it is pumped through a screening and settling system, by which the fibres are soaked and cleaned free from knots, bark and other matter, and only the pure fibre goes to the paper plant.

Machine Room.

Two paper machines are installed, one a straight Fourdrinier, and the other a special machine for making so-called machine glazed lines, extensively used for envelopes for mailing catalogues, etc. The Fourdrinier will produce thirty tons per twenty-four hours while the other machine will make ten tons in a like time.

The papers are made of a natural dark brown color, and since no acids or colors are used are absolutely anti-tarnish, and on this account are very desirable for wrapping silver ware, cutlery, etc.

Recovery Plant.

One of the principal features of this plant and one that has a considerable bearing on making the process a commercial possibility is the department for the recovery of chemicals. Valuable chemicals are contained in the liquors and gases resulting from the process of cooking or digesting the wood. Volatile oils are given off and mixed with the steam used for heating the wood that is in contact with the solvent liquors in the digesters. This steam and gas is drawn from the digester at intervals during the cooking process; and the turpentine and other by-products are extracted by condensation for further separation and refining.

The solvent liquors are blown from the digesters with the wood after it has been completely cooked under the proper pressure of steam; and these liquors are separated and washed from wood pulp by the diffusion system which completes the washing process by the addition of a small amount of fresh water.

This feature of keeping the spent liquors to a high point of concentration is a most important element in the final recovery of chemicals and the diffusion washing assists to a marked degree in excluding water that would otherwise have to be evaporated by costly methods from the spent, or so-called "black liquor." The black liquor as it leaves the diffuser is conducted to storage tanks, thence through pipes to the recovery furnace. On its way, however, a certain amount of liquid resin is extracted. The reduction of black liquor into a commercial article is accomplished first by the process of evaporation that extracts enough water to enable the residue to burn. The evaporation takes place in a special chamber and is sustained by the heat generated in burning the residue.

When the density is sufficient for the residue to support combustion, it is still in liquid form, and flows to a rotary furnace, where it becomes ignited and burns to a "black ash," which is laden with the chemicals that are recovered.

The black ash is not completely burned, however, in the rotary furnace. There is still some carbon left that must be consumed before the valuable salts are recovered, and this is finally accompanied by further reduction in a smelting pot. A blast furnace is used for this purpose and sufficient carbon remains to complete the reduction and fusion of the various salts that flow from the bottom of the blast furnace in a molten stream to dissolving tanks, where the salts are finally dissolved in water preparatory to going to the liquor preparing tanks.

This solution is causticized with quicklime in the preparation for fresh liquor for cooking pulp wood, and the process just described is repeated until the recovered chemicals again come back to be causticized.

The losses that occur in the use of chemicals which amount to about 15 per cent are made up by adding fresh material at the smelting pots and causticizing pans.

The first paper that was made by this company was in June of last year, but it was not until about August the first, of that year, hat the plant began operating commercially, and the output at that time was but about twenty tons per day, while at this time the capacity has been doubled and something like forty tons are being manufactured each twenty-four hours.

Over two hundred men are employed in the plant and some are skilled operators. The mill starts Monday morning and runs continuously until Saturday evening, the operators being divided into three shifts.

The Southern Paper Company is controlled and largely owned by bankers, together with engineers and chemists under whose direction the developments have been made and who operate the plant.

Mr. J. Lewis Dantzler, of this city and New Orleans, is President, he is also president of the Standard Export Lumber Co., of New Orleans, as well as secretary of the L. N. Dantzler Lumber Company of this place. Mr. A. Shirley Benn, M.P., of London, England, and a director of the Hunter Benn Company of Mobile, Ala., is first vice-president. The second vice-president is Mr. Joseph H. Wallace, of Joseph H. Wallace & Commpany, industrial engineers. Mr. A. F. Dantzler, of Moss Point, vice-president of the L. N. Dantzler Lumber Co., is the treasurer. Mr. Joseph G. Mayo, formerly of the Spanish River Pulp and Paper Mills, Ltd., of Ontario, Canada, is the general manager.

Among the directors are also Francis H. Benn, of Price & Pierce, Ltd., London; William S. Hofstra, of Price Bros. Company, lumber and paper manufacturers, Quebec, Canada, and of the Diamond Match Company, of New York; and J. G. F. Lawson and W. M. Wallace, of Carrongrove Paper Company, of Denny, Scotland.

Others interested are Sir Alexander Klienworth, of Klienworth Sons & Company, London, England; A. E. Bowen of Wilson Sons & Company, E. Macky Edgar, of Sperling & Commpany, bankers, of London; J. Charles Potter, of the Wall Paper Manufacturers, Ltd., London; Hon. A. Bonar Law, M. P., I. Hamilton Benn, M. P., and other members of the English Parliament.

The plans for this million dollar paper plant were executed by Joseph H. Wallace & Company of New York, the renowned paper mill engineers of the world.

Size Difficulties

In order to ascertain the degree of sizing in a paper—as stated in a recent issue of the Wochenblatt fuer Papierfabrikation—Dr. Klemm's swim test is often applied very successfully. For this test small pieces of paper (40*100 mm) are tried out as to the time they will swim on the surface of various solutions (2 to 10 minutes and longer if necessary). These tests will produce some very interesting figures with reference to how much sizing there is contained in a paper, further from what sources any size-destroying factors might be expected, and finally with some experience one might even find their origin and cause.

A paper is generally considered to contain enough sizing if same resists the chloride iron or the tannic acid test as many seconds as it weighs grams per square meter. These two tests, especially the iron chloride one, will give very minute results as to the amount of sizing contained in the paper.

For quick and superficial testing the old way with pen and ink or by drawing a small strip of a jacket soaked with ink across the paper, or by more or less wetting the surface of the paper will always be found practical.

Although the known ways and means for testing the sizing of a paper are sufficient in most cases, this cannot be said with reference to tests for determining the causes for any difficulties along these lines.

In such cases quite often reliable experts will arrive at wrong conclusions which seem theoretically correct but can easily contradicted from a practical point of view.

A difficulty as to the sizing which was due to some mechanical influence. For instance a paper was found to be properly sized right after passing through the paper machine or even some time afterwards, but later proved to have rather poor sizing. This might be caused by not having the sheet "closed up" well enough on account of too "free" halfstuff, or through using wood which was grown too quickly or not sound and lean, in other words when the halfstuff was not properly beaten.

In order to overcome these disadvantages, and to maintain the sizing, a proper use of the presses will be found an important factor. Often faulty drying of the sheet, the heating of the dryers not being such as required under prevailing circumstances, will produce a size destroying reaction.

Quite often carelessness is shown in the manner in which the alum or like substances are added. What disadvantages are shown in case the alum is added undissolved, and further, is there any chance for size trouble on account of this form of adding the alum? Is it not possible that only part of the alum will have any timely effect causing thus irregular sizing properties?

Other factors which have their origin in the water used such as the degree of hardness, Carbondioxide, Calcium-chloride, ammonia, etc., might cause the paper to have a better sizing on one side than the other, or a sheet of irregular sizing might show up later.

Although it is not possible to draw any definite conclusions as to the fact that one side of the sheet shows a better sizing than the other, quite a few people seem to be sure that this or that factor was the cause.

The factor which is size destroying or of a reactive nature is in most cases already contained in the sheet while the process of the final sizing takes place at a moisture test of approx. 30 to 50 per cent of the sheet, and at a temperature of 80° to ° cent. of the dryers. Naturally this factor will show up first and strongest at the point where conditions are favorable for such reaction.

Supposing that the sizing forms a kind of a thin film between the various bunches of fibre, and further supposing that the destroying influence is of a chemical nature it will be found that the reaction is greatest where the film of sizing is thinnest and adjoining the largest reservoir of anti-sizing properties.

The miscroscope is best suited to trace any size destroying factors of a mechanical nature and origin. Faulty and imperfect preparation of the halfstuff will show under the miscroscope deep cuts adjoined by steep inclines. The melting size tries slowly to fill up any unevenness and thus rather supports the size destroying tendencies. Thus a swim test on ink will produce on the upper side of the sheet dots of accurate formation or blurred spots.

If such a paper would again partly be moistened to a moisture test of approx. 50 per cent and once more dried at 80 to 90 cent. such a treatment would cause additional shrinkage and consequently a better degree of sizing.

Every paper needs an individual treatment with regards to manufacturing, testing, and last not least as to sizing. No iron clad rules or regulations would be advisable.

Although there has been quite a lot of progress made of late both in the manufacture of size as well as the use of same still there seems to be quite an amount of secrecy about it. All endeavours to better conditions along these lines will be welcome.

ALCOHOL FROM SPENT SULPHITE LIQUOR.

At the last meeting of the Norwegian Sulphite Association, G. Landmark gave a rather interesting lecture on the experiments and tests in connection with Alcohol reclamation from Spent Sulphite Liuor conducted by the Sulfitsprit Co., Ltd., at Drammen, Sweden.

These tests yielded 1.26 volume per cent. of Alcohol reclamation, and it is hardly possible to get better results.

As far as economy of such an undertaking is concerned, it was found that the required plant for reclamation of alcohol from spent Sulphite liquor proved to be a success in every way.

It might be taken as a basis that in a mill with a yearly production of 1,500 tons—air dry—of Sulphite Pulp approx. 6 to 7 cbm. of spent liquor per ton of dry Sulphite can be used for reclamation. Of late it has been claimed that even as high as 10 cbm. could be taken which would result in a still better efficiency of the plant.

Counting on cbm, a yearly production of 1,080,000 liters of 100 per cent. proof alcohol could be effected while 7 cbm would yield 1,260,000 liters yearly. Such a plant is estimated to cost approx. Kr. 200,000 ($57,600.00). The costs of production are 9.68 ore (c 2.78) and 8.72 ore (c 2.51), based on 6 and 7 cbm spent liuor per ton respectively.

The Sulfitsprit Co., Ltd., of Drammen (Sweden) has bought the patent for this process.

White Water

In many paper mills the loss of fibre and other paper making materials in the white water amounts to from 5 to 10 per cent. of the paper made, the percentage loss depending on the equipment of the mill and on the kind of paper made.

This loss can, in most cases, for a very low cost, be brought down to two per cent., under favorable conditions, even to one per cent., or less.

Why waste all that expensive material?

White water tanks of ample size are in most cases a necessity for a good result. Those can either be conical with a baffle plate in the middle for small machines, or, for large machines, oblong, with sides inclined so as to force the settling materials to work down to a spout in the middle of the tank, through which they by mechanical arrangements are conveyed towards the outlet for the water going back to the mill.

Several settling tanks or tank save-alls are on the market, but they are usually expensive in first cost, and in maintenance, and do often need much attention. A main thing with a settling tank is that it can easily be cleaned out.

To give a good settling action in the settling tank it is necessary to have the white water flowing in gently and the mechanical arrangements conveying the settled materials in the oblong settling tank to the outlet for the water going back to the mill, must be run at such a speed that the white water is not stirred up, and still at such a speed that it carries the materials forward.

The surplus white water should discharge from the tank as far as possible from the inlet, and as an overflow, and at a place where the white water is purest.

Paper machines, wet machines, etc., should be erected so that oil and other impurities round the framework does not run down into the machine pits, thus making it possible to let all this water go back to the white water tank.

The only fresh water necessary round a paper machine is for the spray pipes for the ends of the suction boxes for starting up after emptying the white water tank and for washing up hoses.

Spray pipes usually consume far more water than is necessary for the proper cleaning of the wire, either by too coarse a perforation or, still worse, if they are provided with two rows of large holes.

What is said above regarding paper machines also holds good for mechanical and chemical pulp mills. Spray pipes on wet machine felts and hoses for cleaning, as well as water for starting up, are the only places where white water is necessary. Spray pipes on screens, grinders, etc., should be arranged so that they can be supplied with white water without being choked. A surplus of white water can also, for respective mills, be used for washing the pulp in sulphite, sulphate, and soda pulp mills.

Wire and felt spray pipes can also be supplied from the white water tank by separate pumps where the outflowing white water is clean and free for fibres. The outlet for this purpose should be located near the overflow, but at a level which always will give an ample supply of water. An ample screen arrangement should be provided to prevent coarse particles to follow this white water and choke the spray pipes.

In case where a large percentage of ground wood pulp is used in the paper, and the quantity of filling materials is small, which latter increases the settling action to a large extent, a considerable amount of ground wood pulp fibres escape in the waste white water.

This overflowing white water should, therefore, pass through cylinder-mould save-alls, provided with a wire finer than that of the paper machine by 10 to 20 mesh.

When paper is made from chemical pulp without filling the settling tank is of little or no use, and the cylinder mould save-all takes its place to recover the fibre in the waste white water.

All this equipment will, however, only partly serve its purpose if the white water end of the mill is not properly looked after.

If hoses, the necessary supply of fresh water for starting up and other fresh water supplies round the mill, which goes to the white water tank, are left open when not needed, the amount of white water going to waste increases, and as also the clearest white water carries some materials, this should be avoided.

To have a check on this at all times an automatic recorder should be provided, showing the amount of white water flowing away. This recorder should preferably be located in the superintendent's office in order that the superintendent in charge has the record before him, and can investigate the reason for too large an overflow of white water whenever this occurs.

An investigation from time to time, or continuously, of the quantity of materials going to waste in the white water should be conducted, mainly in order to find out whether there are any undue escapes of materials somewhere in the mill, but also to determine the actual loss of materials compared with the production.

By utilizing the fine fibres and other materials in the white water, a very much closer woven sheet of paper is obtained, especially where coarser paper like news, manilas, and similar papers are made, but the greasier pulp tends to give trouble on fast-running paper machines.

It is of large importance that dirt is kept away from the white paper, as once there it will to a large extent go into the paper.

PRESIDENT AMERICAN WRITING PAPER CO. SELECTED

(Special to Pulp and Paper Magazine).

Arthur C. Hastings, who has been president of the American Paper and Pulp Association for several years and who retired from that position at the annual convention on February 19, is going with the American Writing Paper Company of Holyoke, Mass., as president. This will be formally confirmed at the directors' meeting to be held on May 5.

Mr. Hastings will reside in Springfield, Mass. During last week he was at Holyoke and Springfield visiting the company's mills. He returned to New York on Friday evening.

The American Writing Paper Company has been without a president since the retirement of W. N. Caldwell several weeks ago. Mr. Caldwell was made chairman of the board of directors and Alfred Leeds became general manager. Mr. Hastings is a man of wide experience in executive capacities. He is president and general manager of the Cliff Paper Company of Niagara Falls, N. Y., and is now president of the United States Paper Export Association, Inc., Of pleasing personality and forceful character, Mr. Hastings' many friends in the trade are confident of a most successful career in his new position.

SALE OF TIMBER LIMITS

The sale by auction of the timber limits of Messrs. H. M. Price & Co., lumber merchants, Quebec, now insolvent, will be held on August 5th next, at the offices of Messrs. La Rue & Trudel, accountants, 126 St. Peter street, Quebec. The limits include a total of 527 square miles, along the rivers St. Jean, Saumon, Magpie, and Chambers; also a certain area of freehold land to be used as a mill site. Particulars regarding the properties and conditions of sale are given in another column.

UNION BAG & PAPER CO. ANNUAL

The Union Bag and Paper Company held its annual stockholders meeting at the corporate office of the company, Exchange Place, Jersey City, N. J., on April 14. Guy Morrison Walker and John A. Kimberly were elected to the directorate to fill vacancies. A resolution was passed authorizing the president to appoint a committee of three, of which he should be one, to formulate a plan for the development of the company's resources and to improve the company in every way. The meeting was adjourned until June 16, when the special committee's report will be received.

Immediately following the stockholders' meeting the directors met and elected the following officers: John S. Riegel, president; Charles R. McMillen, vice-president, in charge of sales; John A. Kimberly, vice-president in charge of manufacturing; E. S. Coleman, treasurer, and E. B. Murray, secretary. Mr. Murray is the only new officer, his former position being assistant-secretary, but he acted as secretary during the past year.

The committee appointed to work out the details of the plan for improvement and a constructive policy consists of John S. Riegel, president of the company; Guy Morrison Walker and August Heckscher, directors. Metropolitan dailies misinterpreted the purpose of this committee, which was not to the extent of conducting an investigation of the financial affairs of the company.

President Riegel's address to the stockhholders is given in full below:

April 14, 1914.

Ladies and Gentlemen, Shareholders of the Union Bag and Paper Company,—There is little to be added to the remarks contained in the communication mailed to you by the Stockholders' Commmittee under date of March 20th last, and my own communication under date of March 21st. These two statements, taken together, set forth the affairs of the company quite as well as I could put them before you now.

In regard to the condition of business, it remains quiet and below normal. The selling price of bags is somewhat higher than it was a year ago. It is rather difficult to forecast what the result of these two conditions will be in the way of money profits.

The company, in order to show adequate earnings, stands in need of two things: First, the development of its Canadian properties; and second, modernizing its older manufacturing plants in the United States.

As to the Canadian property, which was acquired in 1905, very little money has really been expended for development work. The building of water power and conducting lumbering operations require a vast amount of capital, and we really have placed in Canada scarcely 10% of the capital needed there to carry the properties of the company located on the other side of the border line to their complete development.

I think we should begin without delay to institute plans looking towards the development of these valuable Canadian properties. It must be remembered that, even though plans were in hand and funds as well, several years would pass by before the actual construction work could be completed.

More closely at hand, and in the minds of the management, is the condition of certain of the manufacturing properties in the United States.

I am quite certain that if your management had in hand, say, one million dollars, to expend on plants, that we could earn in a very short while four or five times the interest on such a sum.

It seems to me that the shareholders of the company should give careful thought to this phase of the situation.

I now have the pleasure of leaving the meeting to you.

The following resolution was unanimously adopted at the stockholders' meeting as a result of the foregoing address:

''Resolved, that whereas the management of the company has stated the need of funds for the improvement of properties; and, that, whereas, the credit of the company is influenced by the great disparity between the selling price of its Preferred and Common Stocks and the par value thereof;

Therefore, be it resolved, that a committee of three be appointed by the president, of which the president shall be a member, to consider constructive plans for the development of the company, and to report back to the stockholders any recommendations that they may have to make forty-five (45) days after the date of the annual meeting, or about June first.

Be it further resolved, that this meeting be adjourned until June sixteenth, on which date it shall meet again at the offices of the company, at 15 Exchange Place, Jersey City, at 11 a.m., to take action on any recommendations that may be made by said committee, and that a copy of this resolution be mailed immediately to stockholders of record.''

BELGO-CANADIAN PROGRESS.

The Belgo-Canadian Pulp & Paper Company is making progress with plan enlargements. The new sulphite plant of a capacity of 50 tons daily will be ready in October or November. The new paper machines of 60 tons capacity will not be ready until March, 1915; the present output is 120 tons per day. Mr. H. Biermans, managing director of the company, who has just returned from a visit to Belgium, says monetary conditions in Brussels are cheerful. ''Our own financing of the paper company's extension, of course, was completed last year when we made a successful issue of 8,000,000 francs in 5 1-2 per cent. bonds at par,'' remarked Mr. Biermans. ''We had some other projects in view, but it was useless to suggest anything new in Brussels. Bankers there did not want terms of the new propositions. Money is scarce and confidence somewhat disturbed. Government loans are now to be had on as high as a 5 1-2 per cent. basis, and investors temporarily are putting their money into such issues.''

TO APPEAL GERMAN PULP DECISION.

The United States Government has ordered that an appeal be taken to the United States Customs Court of Appeals in the matter of German wood pulp made from Russian wood. The Treasury Department notified the Assistant Attorney at New York that an appeal be made on April 8th. The letter, as addressed to the Assistant Attorney, says in part:

"………. Certain wood pulp manufactured in Germany from wood grown and cut in Germany and Finland, but not in Russia, was free of duty under the favoured nation clause of the treaty with Germany. File an application with the U. S. Customs Court of Appeals against the decision of the Court of General Appraisers."

The B.C. Royalty Act

The following letter relative to the recent Timber Royalty Bill, passed at the last session of the British Columbia Legislature, has recently appeared in a number of newspapers in the United States. The letter was sent out by the Forestry Department at Washington:

"The Canadian Province of British Columbia is showing the way to all other governments in the matter of doing things for the common people. The B. C. Legislature passed a law introduced by the Minister of Lands, Hon. Wm. R. Ross, which assures to the citizens of that province an income, within ten years, of three million dollars a year from royalties on publicly-owned timber. This Act, according to information which comes to interested public men in Washington, does for publicly-owned timber in British Columbia, what the conservationists, under the leadership of Gifford Pinchot, have been trying to secure for the people of the United States.

"The Act retains in the Provincial Government, for the people, the fee simple title to all timber lands; it permits the taking of timber claims one mile square at an annual rental of $120 per claim, and for the payment to the government of a stumpage price which rises gradually with the increased value of timber. Under the old Act of 1905, the stumpage price per thousand feet was 50 cents. The new Act increases it to 75 cents a thousand feet, effective in 1915, and provides that five years later there will be added to the royalty price 25 per cent. of the increased value of lumber at that time, above a minimum price of $18 per thousand, each five years thereafter the same thing will be done again, the percentage taken by the government to increase gradually from 25 to 40 per cent., the whole arrangement covering a period of 40 years.

"This means, first, that the lumbermen get a reasonable profit out of their operations—the government takes nothing unless the price is above $18 a thousand. It means, further, that the government, the people, share in the increased value of their timber. It establishes a great profit-sharing, co-operative principle, in which the government and the timber operators are partners. The government retains the title to the land, and their right to prescribe the way in which the timber shall be cut. The people's interest is protected, and at the same time lumbermen are encouraged to take up holdings and develop the timber industry.

"The great lesson for the United States in this B. C. Royalty Act lies in the recognition by the Provincial Government that the people should share in the increasing value of their own property—a principle which American conservationists under the leadership of Pinchot, have been and are fighting to have enforced in the development and use of public water-powers in the United States."

Bamboo Paper Pulp

According to the United States Consul General in Hong Kong, the matter of developing this industry in India has been discussed in the Indian Forest Records by officials concerned in the utilization of the forests of India, the report being designed to afford data for action on the part of investors. To secure definite facts for the purpose a considerable number of localities known to have large growths of bamboos were selected, and information was secured from them as to the various species of bamboos to be had, their respective advantages for the commercial manufacture of pulp, possible advantageous sites for factories, the cost of trasnport, cost of labour, and similar data. Five places in Lower Burma and six places on the West Coast of Southern India were selected as localities especially favourable from the standpoint of raw material, transport facilities, and available markets. The enterprise in India seems to hinge largely upon the question of satisfactory and cheap transportation. Two notable factories have been established for the pulping of bamboos, one by the Mitsu Bishi Goshi Kaisha in Formosa, and the other by a Hong Kong corporation near Haiphong, in Indo-China. The last-named concern best represents the commercial phase of the business. The company was organized about three years ago, and the plant was purchased in Scotland. The installation was considered complete about a year ago, and an attempt has been made during the past year to manufacture pulp. The second plant of consequence in this industry, that of the Mitsu Bishi Goshi Kaisha, in Formosa, has been in operation a little over a year. It was established after years of experimenting. The entire output of the factory is used in the paper mill of the same company at Takasago, Harima, Japan. It appears that the bamboo pulp is more expensive than ordinary imported pulp, but that it is suitable for the manufacture of Japanese paper of high quality, and that its use is fairly profitable for such special purposes under the conditions obtaining in Formosa and Japan, and with the same company working the pulp mill and the paper plant. The critical feature of the entire enterprise seems to be in the matter of bleaching the pulp. Experts claim for bamboo pulp certain advantages, among which is the fact that bamboo pulp can be had in parts of the world where other materials are not to be had; it can be made with a regular land crop, controlled by the pulp factories, which can be produced in any amount in three years; it is usually accessible to water or other cheap transportation; it produces a fine pulp, which felts readily and produces a thick, opaque paper of greater thickness than usual for its weight, making it especially suitable for particular varieties of paper; the fine, flexible fibre is easily digested by the ordinary bi-sulphide process, and the bamboo can readily be handled mechanically and chemically.

IRON IMPURITIES IN PAPER

By Harry A. Maddox

(Written specially for the Pulp and Paper Magazine).

Iron compounds, spots or particles, form one of the chief classes of impurity present in many grades of paper. Exceedingly few of the cheaper varieties are free from iron in some shape or form and more often than not its presence represents an impurity. The subject is not a very serious one in the case of these low grade products, but when fine papers, and particularly white printings and writings selling at a good price, come up for consideration, it must be admitted that the intrusion of iron and its compounds constitutes a problem of great importance. Much has been written, in a scattered way, about iron in paper, how it gets there and how to detect it, and to some of these notes we must acknowledge our indebtedness for part of the information here set forth. Our object has been to compile sufficient data on the one subject to form a fairly comprehensive treatment.

Wood itself is practically free from iron in any shape or form, but the finish of a high class paper demands the inclusion of a certain proportion of rag stuff. Rags, according to their origin and condition, contain iron bodies varying in character, composition and amount. Portions of old and used garments frequently bring into the mill such miscellanies as hooks and eyes, steel buttons, clips and fasteners, etc. The dust from old cotton rags has been found to contain as much as 65 to 70 parts of iron per 100,000. In this connection it may be noted that an experiment with a magnet among the dust is likely to give conclusive evidence of the presence of minute particles of the metal in many instances. Much may be done toward ridding the obtrusive element by cutting and vigorous dusting of the rage, accompanied by careful sorting and picking. In the case of the highest grade paper, if there is any doubt about the freedom of the rags from attachments, hand cutting represents the best method of control. Colored rags, which have been dyed by the aid of iron modants should be eschewed, save for middle and low grades. It is difficult to eliminate the firmly fixed salts from the fibre.

Tests for the presence of iron in the raw material may be carried out by digesting the rags in pure, dilute hydro-chloric acid and treating the extract in the manner shortly to be described under another subheading.

Another source from which iron bodies are derived, usually in the form of ferrous bicarbonate is the water supply. Ultimately the ferrous compound becomes oxidized to the ferric state. Cellulose readily absorbs iron salts from its solution, and as this applies to any form of cellulose, the presence of iron compounds in the water is of much importance to all papermakers. The probable effect of the introduction of the body in the aforegoing manner is to lower the ultimate tone or color of the product. This discoloration may not become apparent for a considerable period after leaving the mill, but directly the paper comes into contact with conditions favorable to organic reaction, the impure ingredient plays its part in the degradation process. Apart from the possibilities of iron salts coming in with the original water, there is also the danger from storage reservoirs or settling tanks, which may consist wholly, or in part, of iron.

Iron in water is chemically expressed as so many parts per hundred thousand, and for good quality papers this proportion should not be allowed to exceed 20 parts per 100,000. Periodic tests will show some variation in the content, but if the proportion runs unduly high further investigations should at once be made into the cause. A rough qualitative test for the presence of iron consists in adding a few drops of nutgall tincture to the water. If the liquid remains colorless, iron may be taken as absent therefrom, whilst if it is present, a dark coloration ensues, varying in depth according to the amount of iron contained. To the papermaker, however, the quantitative test is infinitely of more importance and value, for it is the amount of iron in the water that is the main factor. This tests depends upon the usual Prussian blue formation through the medium of potassium ferro-cyanide and its reaction upon the ferric compound. It is carried out according to the following procedure:

Prepare a standard iron solution by dissolving 0.861 grammes of iron alum in 1 litre of distilled water. This solution should then be labelled to contain 0.1 grammes of iron per litre.

Evaporate now 500 cc's of the water under test to dryness after adding a few drops of nitric acid, free from iron. Dissolve the residue in 50 cc's of pure water, pour this solution into a Nessler glass and add 1 cc of very dilute potassium ferro-cyanide. The blue coloration that ensues denotes iron, and it is now required to guage the quantity. To effect this, match up the blue color by adding to 50 c.c. of distilled water in another cylinder a known volume of the standard ferric salt, a few drops of nitric acid and 1 c.c. of the ferro-cyanide solution.

From the resultant data calculate out the amount of iron in parts per 100,000, which equals N X 0.02, where N represents the number of c.c.'s of the standard iron which corresponds to the iron in 500 c.c.'s of the water.

This mode of testing for iron holds good for the determination of the presence and extent of the impurity in rags, clay, alum, finished paper, etc., therefore any succeeding mention of test must be referred back. According to Klemm, the yellowing, or darkening of color, in modern sorts of printing paper is largely due to the presence of organic compounds formed between the resin used for sizing and the iron salts contained in the precipitant, namely, sulphate of alumina. Schoeller, however, refutes this on practical evidence, for he has proved that iron plays a negligible part in the reaction unless present in considerable quantity. Resin itself has been shown to alter the white color of the paper containing it to a sandy tone by oxidation on exposure to heat, light and air. Theoretically, iron does not exert any undue influence unless present to the extent of 0.04% in the form of resinate, calculated upon the total resin present. This amount is far in excess of what might be expected from alum under any ordinary conditions.

The probability of iron compounds finding their way into the ultimate product from other sources must be taken into consideration, when it may be found that the stipulated minimum of ferric bodies might be closely approached, if indeed not exceeded.

Alum of a good quality should be entirely free from iron residues, but many of the cheap grades will be found to hold a dangerous amount. Aluminium sulphate from china clay contains about .0025 per cent. of iron in the best grade, less than 0.2 per cent. in the second grade, and considerably more in the low grades (Stevens).

According to another authority as much as 0.15 does no harm in high grade writing or printing papers, while over that amount tends toward a paper that will lose its color purity in exposure. The presence and amount of iron in alum may be detected by acidifying the solution with iron free nitric acid and carrying out the aforementioned test. Another quick qualitative method for determining the presence of iron is to treat a small portion of the alum, dissolved in hot water, with an excess of pure potassium hydrate. The addition is made while the solution boils, and for some little time afterwards the boiling point should be maintained. If iron is present in an inorganic form, it separates out as a flocculent brown precipitate.

Papermakers clays frequently contain iron in more or less amount and it is advisable to exercise a regular control over the various consignments of clay as they arrive. The embodiment of iron compounds in large amount is not to be expected owing mainly to the adverse influence on the color. The better grades of china clay never contain an appreciable amount of iron, but the low grades may often carry traces sufficiently powerful to ultimately deteriorate the manufactured product. A test may be undertaken by extracting with pure hydrochloric acid and proceeding with the colorimetric determination as before.

Metallic spots in paper are a well known source of degradation to otherwise fine grades of stock. These spots may be copper, bronze, lead or iron, but we are only here concerned with the last mentioned. Even the iron spot may occur in several forms, e.g., metallic, iron, iron oxide or rust, organic iron, or rather compounds of iron and grease. Such like particles may find their way into the paper from the water supply, the various pipes or tanks through which the water or stuff passes, or in which it may stand temporarily. Probably the most fruitful source of iron particles is the beater or refiner, i.e., when steel bars or bedplates are in use. Particularly does this apply when the knives on the roll are composed of harder metal than the bedplate, or vice versa, for then chipping is continually going on. Even if the danger from chipping is reduced to a minimum the introduction of rust spots may not be overcome. The wet steel oxidizes, absorbs carbonic acid gas, and thus forms a rusty surface, which, being brittle and loose, falls away in fragments among the next lot of stuff. Brass or phosphor bronze is recognized as the superior metal for beaters, refiners, etc., but if steel is preferred it should be carefully and thinly painted over with one of the patent rust preventing paints on the market. Of course, the layer would not extend to the cutting edge, otherwise another and worse type of spot would be promoted. Iron particles in paper have been known to arise from defective cylinders and worn bearings, undue friction often being the responsible agent for the deterioration. Probably the best method for removing the iron particles which creep into the pulp prior to its flow on the wire, is to instal a powerful array of removable electro magnets in the sandtrap. Ordinary magnetic rakes serve the purpose fairly well, but unless they are easily removable and adjustable their efficiency is greatly impaired.

To test for iron spots in paper, first examine the defect closely in order to ascertain its nature. If black, opaque, and glistening in the centre, there is no doubt the impurity is metallic iron. A reddish or brown coloration, with possibly a dark shaded centre is characteristic of iron oxide, or rust. This form of iron spot is more commonly met with than the metallic variety, for the latter usually meets with damp, heat and carbon dioxide, which are the agents responsible for speedy oxidation of iron. Even the travel over the wire and through the cylinders and calenders of the paper machine is sufficient to transform the metallic particles into the oxide in most instances.

To determine whether doubtful spots are iron or other metal, pour over the place a drop of potassium ferro-cyanide, which with iron will produce a blue coloration. If a brown stain results, the spot is evidently copper or bronze. Occasionally, iron spots surrounded by grease or resin are met with. To identify these, dissolve out the greasy matter with ether or alcohol and apply the blue color test.

Obviously the problems of iron in paper are of serious import to the makers of fine grades of writings and bookpapers. It behoves them to exercise a strict watch over the introduction and presence of iron in any shape or form if a product of purity and durability is to be turned out.

U. S. Imports during February

(Special to Pulp and Paper Magazine).

Washington, D.C., April 26, 1914.

According to the figures of the Department of Commerce, imports of paper into the United States during the month of February amounted to $1,998,835 in value, an increase of $417,112 over the corresponding period a year ago. Imports of paper and its manufactures during the eight months ended February 28, totalled $18,087,339, as against $14,271,080 and $11,983,295 imported during the corresponding periods of 1913 and 1912 respectively.

Importations during February of newsprint paper amounted to 43,934,045 lbs. valued at $864,483, as against 26,042,043, valued at $525,066, imported in February, 1913. Of this amount 43,196,468 lbs., valued at $831,458, came in free of duty, an increase of 20,777,700 lbs. over the free entry of a year ago.

Wood pulp imports during February, 1914, fall somewhat shy of those of February, 1913. The figures follow:

	Feb., 1914.		Feb., 1913.	
	Quantity.	Value.	Quantity.	Value.
Mechanically ground,				
Free ..	20,066,477	$ 148,812	13,994,046	$ 111,739
Duty ..	———	———	3,178,330	25,288
Chemical unbleached,				
Free ..	53,000,348	883,554	4,262,501	79,635
Duty ..	———	———	60,656,260	960,726
Chemical bleached,				
Free ..	11,378,545	271,780	799,059	21,449
Duty ..	———	———	18,941,713	424,525
Total ..	84,445,370	$1,304,146	101,831,909	$1,623,362

Pulp wood importations, however, showed a slight gain over the preceding year, there being 83,373 cords, valued at $501,802, brought in during February, 1914, as against 66,373 cords, valued at $409,976 imported in February, 1913.

BRITISH TRADE NEWS

SPECIAL TO PULP & PAPER MAGAZINE

London, April 20, 1914

The Anglo-Newfoundland Development Co., Ltd., of London, who are proprietors of the large paper and pulp mills in Newfoundland, have contributed $4,800 to the fund that has been raised to help the widows and distressed dependents of the Newfoundland sealers who lost their lives in the recent disaster.

British Paper Makers' Association.

The annual meeting and the annual banquet of the British Paper Makers' Association will be held on April 23rd in London. Elaborate arrangements have for some time past been made for the event, and it is quite certain the question of the workers' union label —the adoption of which requires all mills to be transformed into a trade union mill—will occupy a prominent place in the meeting's agenda.

Paper Imports.

The Trade Board returns for March show a small increase in the British imports of paper from all countries. The following are the figures:

	1913 Cwts.	1914 Cwts.	1913 £	1914 £
March	989,922	1,062,749	577,117	638,657
Jan.-Mar. .	3,030,311	2,990,748	1,806,883	1,845,117

Printing and writing papers on reels were imported to the extent of 135,906 cwts., as against 133,067 cwts. in March, 1913. No supplies were received from Newfoundland. Printing and writing papers not on reels were imported to the extent of 77,842 cwts., compared with 80,824 cwts. during March last year. Paper hangings reached 6,325 cwts. compared with 5,544 cwts., coated papers 8,374 cwts., compared with 8,210 cwts., and packing and wrapping papers 373,440 cwts., as against 324,824 cwts. in March, 1913. Germany enjoys the largest trade with England in paper hangings, whilst Scandinavia does the biggest business in all the British markets in cheap news print and cheap writing paper. Canada is a large exporter of wood pulp boards to the English, Irish and Scotch markets. The imports from all countries in March reached 117,077 cwts., compared with 97,254 cwts. in March, 1913. Makers of boards in the Dominion should note this substantial increase inside of a year, and every effort should be made to capture a little more of the trade that is going. Canadians will always be given first consideration before any other foreign country, but the British buyer wants a traveller to call upon him and one who will be able to give him terms nearly as good as the foreigner. This can easily be achieved if the right way is adopted.

British Exporters.

For the first time this year the British exports of paper of all kinds, including cardboard, show an increase. The following are the figures:

	1913 Cwts.	1914 Cwts.	1913 £	1914 £
March	282,791	302,705	310,964	313,820
Jan-Mar.. .	894,038	895,474	956,707	920,116

Writing papers reached 16,141 cwts., a reduction of 3,458 cwts., when compared with March, 1913. Printing papers also show a reduction of 4,170 cwts.—156,238 cwts., compared with 160,408 cwts.—while packing and wrapping papers rose to 85,362 cwts., comhanging decreased by 2,335 cwts.—14,751 cwts. compared with 16,906 cwts.—and coated papers by 727 cwts, with 16,906 cwts.—and coated papers by 727 cwts., the figures being 2,062 cwts., as against 2,789 cwts. in March, 1913. Pasteboards, millboards, and card boards were reported to the extent of 9,539 cwts., an increase of 2,417 cwts., and paper bags to the extent of 5,058 cwts., as compared with 4,314 cwts. in March last year. The increase in the exports is really attributable to good trade being done in packings and wrapping papers, boards and manufactures of boards, and paper bags. But newsprint, writing paper, paper hangings, envelopes, and coated papers have not yet reached an increase in the export trade returns, which shows that the British mills are still going through a dull spell of trade. Canada imported from England 252 cwts. of writing paper, as against 869 cwts. in March, 1913, and 8,517 cwts. of printing paper, as against 6,650 cwts. in March last year.

Wood Pulp Imports.

The imports of wood pulp into the British market during March were as follows:

	1913 Tons.	1914 Tons.	1913 £	1914 £
March	48,040	39,217	181,582	172,256
Jan.-Mar.. .	180,757	167,699	796,945	746,475

The depressed state of the paper industry is largely attributable for the small consumption of wood pulp. Mechanical wet was received as follows: Sweden, 1,208 tons, compared with 958 tons in March, 1913; Norway, 24,113 tons—a reduction of 10,653 tons over March last year—Canada no supplies at all, compared with 505 tons in March, 1913, and other countries nil also. It will be observed by these figures that Norway has been the greatest sufferer, and though there are reports that supplies are not accumulating in that country, it seems significant that mechanical is selling at the price of 32 kroner per ton, which includes agents commission and f.o.b. Since January to March 31st, Canada has reported 5,602 tons of mechanical wet to England, compared with 1,196 tons for the same period of 1913. Other imports were: Bleached chemical (dry), Russia, nil; Sweden, 150 tons, an increase of 61 tons; Norway, 747 tons, a decrease of 493 tons; Germany, 89 tons, an increase of 57 tons. Unbleached chemical (dry): Russia, 930 tons; Sweden, 3,396 tons, compared with 2,923 tons in March, 1913; Norway, 2,779 tons, as against 2,913 tons; Germany, 5,160 tons, compared with 3,539 tons; Norwegian exports are down all round.

Africa's Prospects.

The Pretoria Civic Association has an Industries Committee, and, acting on the advice of that committee, the Association some time ago decided to send to Bertrams, Ltd., the papermakers' engineers of Edinburgh, samples of raw materials so that a paper making industry might be started. Bertrams, Ltd., have made a report, which states, inter alia: "The wild grass is very much superior to the maize stalks and leaves, and unless the maize can be got at a very much lower cost than the grass, we would recommend you to adhere to the grass, as it is material capable of making high quality papers if required. We understand, however, that it is your intention to manufacture coarser papers, such as brown paper for wrapping purposes and the like, and we have no hesitation in saying that the grass is excellent material for this purpose.'' Samples of pulp from the grass and from the maize stalks have been sent out by the firm, which considers that the sample made from grass treated with caustic soda is the best. From this high-class papers could be made. The firm gives details of a plant which it is certain would give every satisfaction, and states: ''We are therefore putting before you a scheme which will produce the paper you require at very much less cost than has hitherto been possible, and the saving to you therefore will be considerable. . . You will therefore be able to produce paper at a cost which represents great saving over existing methods, and we think therefore that the fairest method of dealing with you in a matter of this kind is that you would pay a royalty for every ton of paper produced. To fix this royalty we think it would be absolutely fair to fix at one-half of the saving that would be made with this process as against any other process you can adopt.'' Further, the report states: ''We are quite prepared to take the whole of the responsibiliy in connection with the treatment of the raw material, and are quite willing to give you any assistance in connection with this.''

Offset Paper.

In England, printers are giving a good deal of attention to paper suitable for what is known as the offset printing press, and it is quite evident that paper mills will have to give the subject serious consideration in the near future. Mr. H. Goldshaw, manager of John Dickinson & Co., Ltd., Home Park Paper Mill, says that papers for use on the offset press and photogravure machines need not necessarily have rough surfaces to gain the best results in printing. He was of the opinion that coated papers would become more general, as they helped the ink to a considerable extent. Coated papers were manufactured in England as far back as 1814, and clay was the chief constituent in the old coated papers, which gave them a dull finish. According to the present-day methods, the results were more satisfactory, as following the dull coated paper came the arrival in quick succession of a blue-white finish, but owing to the bright surface being strongly objected to, further experiments were tried. He was of the opinion that for chromo papers a double-coated paper with a fine sizing gave the best results for printers; whilst for process work nothing could touch a fairly absorbent surface. He attached great importance to the time allowed for finishing and seasoning stocks of coated papers, particularly where the hot-air process of drying was not installed. Americans are now making a specialty of offset papers.

The Burnley Paper Works Co. have declared a dividend of 5 per cent., and the Gandy Belt Co. a dividend of 11 per cent. Messrs. Edward Lloyd, Ltd., report that they are doing a growing business with Canada and the other colonies.

George E. Challes, Toronto, sales manager of the Riordon Pulp and Paper Co., has returned after an extended trip through the Western and Middle West States. He reports business on the whole as being very fair and a hopeful tone prevailing with regard to the future.

Ottawa Notes

LUMBER FREIGHT RATES INCREASED.

Ottawa, Ont., April 25.—The lumber end of paper manufacturing companies will be affected by the decision of the Canadian railways to increase their export rates on lumber of all kinds from points throughout the Ottawa Valley to Montreal as well as the rates for domestic shipment. This is expected to be the forerunner to a general increase in all rates between the two cities.

Objection to the proposed advance was voiced before the Railway Commission last week by representatives of the Canadian Lumbermen's Association and the Montreal Lumbermen's Association, and after hearing some discussion, the Board reserved judgment. When the case was called Mr. Frank Hawkins, secretary of the Canadian Lumbermen's Association, said lumbermen would like to have an explanation of what the railways proposed to make the increases.

Chairman Drayton pointed out that the issue involved was whether the railways were prepared to disregard water competition between Ottawa and Montreal, hitherto supplied by the Ottawa River and connecting canals. Mr. E. P. Flintoff, counsel for the Canadian Pacific, said that road was willing to disregard water competition.

Mr. Hawkins then told the Board that before May, 1908, the summer schedule of rates on export lumber was 4 cents per 100 pounds and 5 cents per 100 pounds domestic rate, from Ottawa Valley points to Montreal. In May of that year both rates were increased to 5 cents, an increase of 17.36 per cent. Now it is proposed to advance both export and domestic tariffs to 6 cents, or a total increase since 1908 of over thirty-six per cent. The usual 30 days' notice had not been given, and therefore lumbermen who had promised delivery on the basis of the 5 cent. rate stood to lose if the railways were allowed to put this increase into effect in May as proposed.

Mr. J. E. Walsh, of the Canadian Manufacturers' Association, and Mr. W. S. Tilston, of the Montreal Lumbermen's Association, supported this contention, while Mr. Flintoff, for the railways, argued that they were entitled to make the increase. The fact that water competition between Ottawa and Montreal, once an important factor, had now practically disappeared, was, Mr. Flintoff admitted, the principal reason for making the increase.

That this increase in lumber rates would, if it went through, prove only the prelude to a jacking up of rates on pulp and paper between Ottawa and Montreal was the opinion expressed by a well-known member of the trade, and generally shared. The only remedy would be a revival of the shipments by boat along the Ottawa River and connecting canals to Montreal so as to provide water competition once more.

Right to Supply Power Not Allowed.

The status of all pulp and paper companies in Ontario which seek to export their surplus power is affected by the decision of the Private Bills Committee of Parliament this week with reference to the application of the W. C. Edwards lumber firm, of Ottawa, for wider powers. Senator Edwards, head of the firm, made application to the committee to secure the right to dispose of surplus hydro-electric power which is being developed at the Edwards plant at the Little Chaudiere Falls, but the committee decided not to grant this right until the Ontario Hydro-Electric Commission had been consulted, as the enlarged powers desired might prove a source of competition for the Commission. The Hydro Electric Commission proposes to enter the power field in Eastern Ontario and several members of the committee held it was right to give a private company powers which would allow it to compete with the Commission in supplying cheap power.

Senator Edwards, in an interview later, said the idea was absurd. He explained that he was president of the Hull and Ottawa Power Company, from which concern the Hydro Electric Commission bought most of the power with which it supplied the City of Ottawa through the Ottawa Municipal Electric Commission.

The High Commissionership.

In connection with the unofficial announcement that Hon. George H. Perley will be appointed Canadian High Commissioner in London, in succession to Lord Strathcona, it is of interest that Mr. Perley was a well-known figure in the pulp and paper trade before his retirement from active participation therein. He succeeded his father as a member of the firm of Perley and Pattee, and later merged his interests with the Riordon Pulp and Paper Company, of Hawkesbury, Ont. Born in the United States, it is said that Mr. Perley will have to take out naturalization papers in England if he goes there, or will otherwise be considered as an American citizen.

"MAC."

Envelope Papers with Malachite Mottling

Envelope papers having long mottling fibres of chemical pulp, bast, cotton fibres could formerly be made with a speed of the machine of only about 35 m. For modern manufacture with high speeds of the machine up to 70 m. the following considerations come into question:

Dyeing—For dyeing mottling fibres hardly any but diamine dyes come into question, because they are exceedingly stable to light, air, water and friction. In addition, they possess great fixing power. They are dyed in the beater or in the edge-runners.

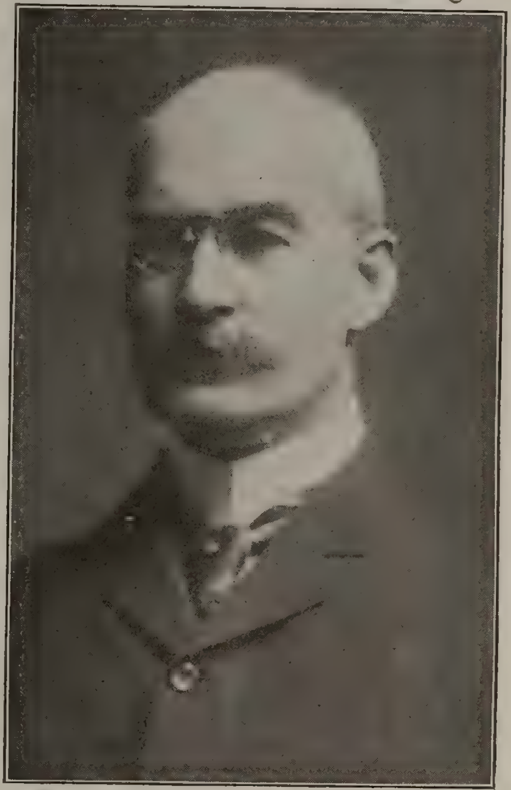
Dyeing should be effected in the beater only in case of emergency and with chemical pulp made from the wood of coniferous trees. Jute rags are cut, removed from dust, boiled with alkalies and washed in the pulping engine. The unravelled long-fibred half-stuff is emptied into the draining chest. The dye freshly dissolved in water is added hot to a mixing-engine with a high density of pulp heated to about 40° C. After being well mixed add 10% dissolved denaturated sodium chloride or an equal quantity of calcined Glauber salts or twice the quantity of crystalized Glauber salts. After heating to about 60° C. add 2% alumina sulphate. Generally 3—4% long mottling fibres are added after the sizing shortly before the emptying.

First add the alum solution and then the dyeing solution in the edge-runners and provide for a thick charge. Viscose sizing and an addition of some potato starch have proved very satisfactory. Cotton is generally to expensive. It is dyed in the beater.

The mingled pulp is loosened by means of refining machines after the dyeing in order to diminish the length of the fibres. The fibres then agglomerate less. Instead of only one rotating strainer three or four thereof will be employed in order to be able to deal with the quantity of pulp requisite for the rapid operation of the machine without disturbances. A large quantity of diluting water facilitates the sorting. The long-fibred mingled mass should be charged into the beater only 10 minutes before emptying and should be only whipped and mixed. The sand-strap must be conveyed with a metal plate which is provided not with slots but with round holes. Without this arrangement the most beautiful marble fibres frequently remain in the sand-trap. On the machine it is preferable to work with two dandy-rolls in order to press the marbling fibres in well. The supercalanear should have as many rolls as possible (up to 14) in order to obtain sufficient finish without having to fear transparency.—Der Papier Fabrikant.

The Late W. T. McLaurin

The death last week of Mr Wilmer T. McLaurin, proprietor of the McLaurin Lumber Company, of Montreal, came as a great shock to his many friends in the lumber and paper industry. Mr. McLaurin's death followed after a short illness. A few days previous to his death he had contracted a severe cold and pneumonia settled in.



Mr. McLaurin was born in Pembroke, Ont., and was about fifty-five years of age. He is survived by his widow, two daughters and three brothers.

Mr. McLaurin was one of the best known business men in Montreal and was exceptionally well-known throughout the lumber industry. He was connected with many fraternal institutions in the city of Montreal. He was vice-president of the St. George's Club at his death, and had been a member of the Caledonia Curling Club for the past twenty years.

Belt Driving

Mr. R. Berry has recently read a paper on this subject before the Birmingham Association of Mechanical Engineers.

Belts are no longer made from leather only, and the first problem is the choice of a suitable material. Mr. Berry favors leather for indoor working in a dry atmosphere, and cotton, canvas, or rope for moist or outdoor conditions. The size of the belt and its duty must also be considered. Leather does not lend itself well to making wide belts nor very thick belts. For these larger drives a woven belt is practically necessary. For small machine belting leather answers very well. In case of breakage or stretching it is readily repaired or shortened; more so than canvas or other woven material. Failures in stretching, hovever, indicate that the belting is not working under satisfactory conditions. Probably the belt is much overloaded, and a new belt or new driving arrangement is desirable. Occasionally it may be possible to use a wider belt, but it is very rarely desirable to employ a thicker one or to work with a double belt. Thick belting and double bands are particularly undesirable on small pulleys owing to the severe bending stresses set up in them as they pass over the pulleys. If at all possible, the best procedure to adopt with a weak belt is to increase the size of the driving and driven pulleys, so that the belt speed is increased, and the necessary driving force exerted by the belt correspondingly increased. In this country it is the usual practice to run leather belts with the soft or flesh side against the pulley. In America, the reverse practice is not uncommon. The English practice seems the more reasonable. When passing round a pulley the outer face of the belt is subject to an increased tension, and it seems desirable, therefore, that the outer face should be stronger, which is the hair or smooth face of the leather. Then, too, the soft side of the leather gives a better friction grip on the pulley face, and slipping is less likely to occur. It is true that the soft side will wear more rapidly than the other, but this wear does not reduce the strength of the belt in the same proportion.

Mr. Berry does not appear favorably impressed by steel belts, and it may be admitted that for ordinary machine driving they are not at present very suitable. Their best field is that of the main drive, where large powers have to be transmitted. As a rule, the steel band runs on rubber or cork faced pulleys, and hence a very high co-efficient of friction is obtained. Owing to the high tensile strength of steel, very thin bands can be employed, and these can be run at high speeds. Indeed, speeds up to 100,000 feet per minute are being employed, but English engineers would prefer to keep below 7,000 feet per minute, because of the high centrifugal stresses in high-speed pulleys. Steel bands reduce the width of the belting and pulleys, and in the case of large powers an appreciable saving is thus effected. Further, the life of a steel belt should be very great, although as a set-off, the life of the cork or rubber facing cannot be very long. Experience with these belts is still very meagre, and British engineers will be well advised to watch their progress carefully. Difficulties and objections always loom large in any new departure, but experience and perseverance overcome many of them.

At first sight it seems desirable to encourage friction between the belt and the pulley. There are, however, modifying influences at work, and the maximum friction is not much better than no friction at all. A driving belt has a tight side and a slack side. The difference between the tensions on these two sides is, of course, the net driving force. The resultant pull on one or other of the belt pulleys is the resultant of these two tensions, and is rather less than their sum in amount. According to the accepted laws of solid friction, the maximum friction is a constant friction of the total load, and from this some engineers have questioned the text-book formula that the maximum difference between the belt tensions on the right and slack sides, increases with the arc of contact. There is, however, no doubt that the friction does increase with the arc of contact, and, without resort to mathematics, the explanation is simple. The friction is proportional to the total load at right angles to the pulley face, and this load is not the same thing as the resultant or net total load on the pulley. Thus, assuming a uniform tension in the belt, it is obvious that the pressure per square inch of pulley face is uniform and independent of the arc of contact. Hence the total load will increase in proportion to the arc. When, as in practice, the tension is not uniform, the ratio of to arc of contact alters, but the general nature of the result remains unchanged. There is another reason why a long arc favors a high driving force. Some air is always drawn in between the belt and pulley face, and acts as a lubricant until more or less completely squeezed out. Obviously, the longer the arc of contact, the bigger the proportion from which the air has been squeezed. One would expect this air lubrication to be more important at high than low belt speeds, but no actual experimental evidence seems available.

Friction between a belt and a pulley is important in another way. Since the tension in the belt varies, it follows that the belt extends in length in passing from the slack to the tight side. Such expansion involves "creeping" on the part of the belt, and this represents a true frictional loss. The amount of the creep is determined by the weakness of the belt and the net driving tension. Obviously an overloaded belt will have a large creepage loss apart from any bodily slipping of the belt. Further, the wear on the belt is due to creeping and slipping. If well-designed, slipping should be practically non-existent; but creeping can only be reduced to a limited extent. Hence to minimize wear, the pulley rims should be as smooth as possible. The necessary adhesion between the belt and pulley should be the result of the natural qualities of the materials, and not due to rough surface.

Mr. Berry gives a simple rule for single leather or woven belting of usual thickness, from which the power transmitted can be calculated. He adopts a net driving tension of 44 lb. per inch width of belt. If a light double leather belt be employed this load may be increased by 25 per cent., and if a heavy double belt by 60 per cent. The above rule gives larger belts of lower powers than other rules widely followed in practice. Something also depends on the joints in the belt. A well-cemented joint is distinctly stronger than a laced one, and will carry higher loads, but laced joints are more convenient, and are in more general use. For good or ill, however, belt widths and speeds are generally fixed by the machine makers, and the user has little choice except in the direction of using weaker belts, generally a quite undesirable policy.—Paper Making.

UNITED STATES NOTES

As the result of a two days' conference the St. Croix Paper Company operating pulp and paper mills at Woodland, Me., signed a two-year agreement with its men granting increased wages and giving other concessions. The agreement is similar to that recently made by the Great Northern Paper Co. with the men at its three mills in Maine, and becomes operative on May 2. The average wage advance is about 11 per cent. for the 61 papermakers, 10 1-2 per cent. for the 175 pulp and sulphite men, and about 10 per cent. for the mechanical men, helpers, etc.

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The Atlas Paper Stock Company of Philadelphia, Pa., is a new firm which has been organized by William A. Coll and L. Jack Martin to conduct a business in the packing of paper mill supplies of every description specializing in the higher grades of waste paper. The office and warehouse is located at 121 South Water Street, Philadelphia, where this concern is nicely equipped to handle all grades of material.

* * *

The State of Maine now has what is believed to be the only paper mill in the United States making the India paper which has of late been found useful in printing large encyclopaedias, as it is a paper very fine in texture, very thin, very light and very strong. This paper has been made in England heretofore. The Warren Paper Company has recently installed a machine to manufacture this paper at its mill in Gardiner, Me., and the process has proved a success. The installation of this and additional similar machines may mean the revival of the growing of flax in large quantities in Maine, as the paper is made from flax fibres.

* * *

New England paper manufacturers recently complained before the Interstate Commerce Commission over the existing rates on printing paper, other than news print paper, from points in New England to points in the territory of the Central Freight Association. The claim was made that the high rates charged were injuring the business. It was stated that in June, 1913, the Boston & Maine and other railroads advanced these rates 20 cents a ton, which action, as stated, made the paper rates much more reasonable. The complaint was signed by the New England Paper & Pulp Traffic Association of Boston.

* * *

A deal was closed during the past week whereby the Keyes interests are again in ownership of the Nashua River Paper Company at Pepperell, Mass. Charles H. Clinton, who with the Hammermill Paper Company of Erie, Pa., purchased this plant from Messrs. Keyes about four years ago and conducted it since as the Nashua River Paper Corporation, recently purchased the interests of the Hammermill Paper Company in the business and organized the Babbatassett Paper Company with the idea of continuing the business under that name. Since this latter corporation was formed, Mr. Clinton sold his interests to Messrs. Keyes, who were large holders of bonds of the Nashua River Paper Corporation, and the concern in future will be known as the Nashua River Paper Company, its original title.

The executive committee of the wrapping paper division of the American Paper & Pulp Association met in the association's rooms at 50 Church street, New York, April 20. Since the adoption of the amended by-laws by the executive council of the parent body allowing the various divisions to elect their own secretaries, the wrapping division has been active in reorganizing and looking out for a man to take care of its statistics. At this session the committee decided upon H. H. Bishop, of Cleveland, Ohio, as the secretary of the wrapping division. Mr. Bishop is a man who has had a great deal of experience as a statistician, and has been identified with association work of the character most desired by this committee. Mr. Bishop's work, however, has been outside the paper industry. The executive committee comprises Frank L. Moore, presisdent of the Newton Falls Paper Company, of Watertown, N. Y., chairman; M. E. Marcuse, of the Bedford Pulp and Paper Company of Richmond, Va.; Allen M. Fletcher, of the Fletcher Paper Company, Alpena, Mich.; George E. Grafts, treasurer of the Orono Paper Company, Orono, Me., and George C. Bayless, of Bayless Manufacturing Corporation of Autin, Pa.

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A contract has just been closed with the Berlin Mills Paper Company of Portland, Me., and Berlin, N. H., with the Connecticut Valley Lumber Company, by which the paper company acquires all the soft wood timber in a tract of 45,000 acres on the Androscoggin slope. There are in it about 500,000,000 feet of soft wood, and this is practically virgin territory. The Connecticut Valley Lumber Company has confined its operations to the Connecticut slope, where it owns approximately 260,000 acres, with a soft wood stumpage of about 1,500,000,000 feet. The contract covers continuous cutting over a considerable term of years at a rate that puts the transaction in the front rank of negotiations in timber and pulp wood. The price at which the sale was made has not been given out, but it is understood to be on a basis commensurate with the present valuations of timber and its rate of enhancement. The Berlin Mills Company expect to use the entire yield in their extensive mills at Berlin, N. H.

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George H. Hinman, former publisher of the Inter-Ocean, of Chicago, Ill., now in the hands of a receiver, has reached an agreement with the Lake Superior Paper Company as to the $600,000 first mortgage bonds outstanding. Attorney Levy Mayer announces that his client, the Lake Superior Company, would no longer contest the validity of the bonds. Attorney John S. Miller argued in behalf of the Adsit estate for a claim for rent of $112,000. Mr. Mayer began his answer. He said the Adsit estate must look to the Columbia Amusement Company.

* * *

The Manufacturers' Paper Company, which has been located for many years at 41 Park Row, New York, last week to the Forty-Second street Building, 30 East Forty-Second street. In the new location the company occupies a large part of the fifth floor facing Forty-Second street and also Madison Avenue, with the entrance at room 504.

* * *

While the reorganization plans of the Remington-Martin group of paper mills in northern New York has not been finally brought to a successful issue, it is reported that work is progressing very favorably. Signatures representing over a million dollars of the claims against the Remington interests have been given as favorable to the Lansing plan of reorganization. About $200,000 in claims have not signed as yet, and until all signatures are obtained the plan cannot go through. It is stated that the outstanding claims are gradually being signed for.

* * *

The Oxford Paper Company of Rumford, Me., will start construction on a two-machine addition to the mill within the next few weeks. Engineers have just completed plans for the wing. The installation and operation of these machines will make a large increase in the output of the mill, and will mean the employment of many extra men. One of the machines will be installed immediately upon the completion of the wing and the other a little later. There will also be additions to the other departments to provide for the new machines.

* * *

The Martine Cantine Company, of Saugerties, N. Y., has filed a complaint with the Interstate Commerce Commission against the et al, in which they attack the rates on surface-coated book papers from their mill to Cincinnati of 26c. as against a rate of 12c from Kalamazoo and 7c. from Hamilton. Other rates attacked are 10c. to New York, 30c. to Chicago, 35c. to St. Louis, 21c. to Cleveland, 25c. to Columbus, 15c. to Buffalo, 23c. to Detroit, 12½c. to Syracuse, 14c. to Rochester, and 18c. to Pittsburgh. It is alleged that the carload rates paid by surface coated book paper manufacturers at Kalamazoo, Mich., and Hamilton, Ohio, to Saugerties are 80 per cent. of the sixth class rate, while from Saugerties to those points the rates are straight fifth class. They ask for a cease and desist order, and the establishment of reasonable rates.

* * *

That the Curry & Whyte Company bought pulp wood from him for which he has not been paid and that measurements of forest products delivered the company were fraudulently misrepresented to him, is the complaint of Gust Anderson in a suit for $10,124.65 filed in District Court at Duluth, Minn. Anderson says he and the company entered into an agreement November 17, 1911, by which he contracted to sell and deliver a quantity of pulp wood. He says he complied with the contract, but the Curry & Whyte Company, after getting the measurements from the mill misrepresented them to him, causing a heavy financial loss.

* * *

The Mansfield Paper Company of Boston, Mass., was formed last week with a capital of $300,000. The company is erecting a modern plant at Mansfield, Mass., for the purpose of manufacturing waterproof papers and specialties. The officers of the company are: Arthur D. Little, the well-known chemist, President; C. E. Gilpin, Vice-president; Freeman Hinckley, Treasurer, and Carl F. Wood, Secretary. Besides the officers, the board of directors is composed of Walter M. Lowney, the well-known candy manufacturer, and Philip W. Wrenn. It is expected the plant will be completed very soon and the concern will be ready to market their product by early summer.

* * *

The Doton H. Slawson Company has leased to the United States Paper Board Company for a term of years the seventh floor in the Burrell Building at 171 Madison Avenue, New York. The space will be used for executive offices of the company, who will occupy the new quarters in the very near future.

The work of enlargement still goes on at the mills of the Champion Coated Paper Company at Hamilton, Ohio. The first of the six new machine engines to be installed in Mill No. 1 has been placed on the foundation, and will be ready for operation in a short time. The new engines are similar to those used in Mill No. 2 and are to drive the machines only, the old engines being retained to drive the constant lines and the Jordans. These engines are variable speed twin engines, and will make it possible to do away with the troublesome and expensive drives, as the speed of the machines will be varied by altering the speed of the engines.

* * *

Last week a deal was closed whereby the Strong Paper Company of Menasha, Wis., secured a long lease upon the property of the Menasha Woolen Mills Company, in which will be established in the very near future a paper pail plant. Announcement was made several months ago that the Strange Paper Company would soon engage patents for which had secured. Since that time the project had evidently been dormant, but the announcement of the deal involving the Menasha Woolen Mills property, together with a statement issued by Mr. Strange, indicates the company in the very near future will have its new plant in operation. Mr. Strange declares there already is business enough in sight to keep the proposed plant running full capacity.

* * *

Francis H. Dewey, president of the Mechanics' National Bank of Worcester, Mass., has been discharged as receiver for the Farley Paper Company, of Wendell, Mass., under a decree handed down by Judge Dodge in the United States District Court on petition of the company to have its property restored to it. The Court allowed $2,500 for fees of receiver and counsel. In dismissing the receiver the Court has extended the time to May 15 for creditors who have not proved their claims against the company. To satisfy these claims the company has deposited $15,000 with the Court for a settlement with such creditors on a basis of 80 per cent. The approved claims amounted to $101,000. The value of the claims against which no proof has yet been made amounts to $4,000 and the claims in dispute and which were disallowed by the receiver amount to $4,500. The company was petitioned into the hands of a receiver on November 18 on petition of the Mutual National Bank. The company at the time had assets of $200,000 and liabilities of half that amount.

* * *

The old Stever Mill, east of Broadalbin, has been purchased by Isaac Allen, of Albion, N. Y., and as soon as alterations are made will be used for the manufacture of butchers' manila paper. This plant is the only one remaining of more than a dozen that flourished in as many hamlets of the county a quarter of a century ago. Air-dried paper board is very scarce in this country and preparations are under way for the operation this summer of the only mill that manufactures it in this section of the State located at the mouth of the Garage Creek at Palatine Church. The board is laid on the ground and dried, and this process gives it a flexibility and resiliency which, it is claimed, cannot be secured by other means.

* * *

Knowlton Brothers, Inc., manufacturers of special papers, at Watertown, N. Y., and the Harmon Paper Company, of Brownville, are among the low bidders for the contract to furnish the Government with paper to be used in making internal revenue stamps, according to the bids just opened in Washington, D. C., by Director J. E. Ralph, of the Bureau of Engraving and Printing. Sometime ago bids were called for to be opened on that date, for the contracts to furnish the bureau with two classes of stamp paper, one class being for the regular postage stamps and the other class for internal revenue stamps. Harmon Paper Company was the lowest bidder, naming a price of 4.47 cents a pound. The Champion Coated Paper Company was next with a bid of 4.48 cents a pound, and Knowlton Bros. came third with a bid of 4.57 cents a pound. The New York & Pennsylvania Paper Company bid 4.8 cents a pound and the Miami Paper Company was higher with a bid of 4.9 cents a pound.

* * *

The wrapping division of the American Paper and Pulp Association has been active in its reorganization. Since the change in the by-laws of the parent body, which allows each division to have its own secretary, the wrapping section has been active in bringing its new organization into shape. On Monday, April 20, the executive committee of the division met in the rooms of the American Paper and Pulp Association, at 50 Church street, New York, and selected H. H. Bishop, of Cleveland, Ohio, to act as secretary. Mr. Bishop will begin his work in May, and will have his office in the rooms now occupied by the Association. His connections in the past have not been in the paper industry, but were with associations. He is thoroughly familiar with Association methods and is a capable statistician and has had the experience most desired by the executive committee.

The committee which made the selection consists of Frank L. Moore, President of the Newton Falls Paper Company of Watertown, N. Y., chairman; M. E. Marcuse, Vice-president and Treasurer of the Bedford Pulp and Paper Company of Big Island, Va.; Allan M. Fletcher, President and Treasurer of the Fletcher Paper Company of Alpena, Mich.; George E. Crafts, Treasurer of the Orono Pulp and Paper Company of Orono, Me.; George C. Bayless, Chairman of the Board of Directors of the Bayless Manufacturing Corporation of Austin, Penn. This committee was chosen by the wrapping paper division at its session during the thirty-seventh annual meeting of the American Paper and Pulp Association at the Waldorf-Astoria Hotel, New York, on February 18 and 19. The members of it were elected to serve one year and their capacity constitutes one of an advisory nature to the division.

* * *

The annual meeting of the stockholders of the International Paper Company was held at the corporate offices of the company at Corinth, N. Y., on Wednesday, April 22. Routine business was disposed of and the following directors, whose terms expired, were re-elected: F. S. Flower, F. B. Jennings, G. F. Underwood and Rudolf Pagenstecher.

ST LAWRENCE PULP & LUMBER CO.'S PLANS

The St. Lawrence Pulp & Lumber Company of Canada, whose incorporation, financed and controlled by William Whitmer & Sons, Inc., lumbermen, and Chandler & Company, Inc., and W. F. Fuqua & Company, bankers, all of Philadelphia, was recently reported in these columns, is one of the most extensive propositions of its kind ever started in Eastern Canada. The company obtained under Crown grant a tract of some 640 square miles of spruce, balsam and cedar and pulp-wood, located in the counties of Gaspe and Bonaventure, Province of Quebec. Its mills will be located on Chaleur Bay (an arm of the Gulf of St. Lawrence) at the mouth of the Grand Pabos River, which of itself forms a spacious bay. Prior to the present ownership of the property, the interests affiliated with its organization had the tract cruised by Messrs. Lemieux Bros. & Company, New Orleans, La., expert timber estimators, who reported the tract superior to any they have estimated in the Province of Quebec, Nova Scotia or New Brunswick. The timber along some of the streams has never been touched. The timber, they state, consists of spruce, balsam, cedar, white and yellow birch, and scattered white pine. Disregarding the pine and birch, they estimate the quantities of timber on the tract, log scale, Quebec rule, as follows:

Balsam	1,212,000,000 feet
Spruce	969,600,000 feet
Cedar	121,200,000 feet
Total merchantable timber	2,302,800,000 feet
Pulp-wood	4,040,000 cords

These totals the estimators consider very conservative, especially the pulp-wood, which they stated to be 10 cords an acre. Practically there is an almost unlimited supply of pulp-wood on this land, enough to turn out easily 60,000 to 100,000 cords a year. The property, they say, could easily support three saw mills of a capacity of 100,000 feet a day each.

The transportation facilities are specially good, as the tract is traversed by four main rivers, the Grand Pabos, the Little Pabos, the West River, and Port Daniel River. The timber is all easily accessible by water and the topography is such that logging by railroad is also very convenient.

As to shipping, the property is accorded the double facilities of railroad and ocean transportation. It is four days distant by water and two or three by rail from New York and nearer in point of time to that city than the timber fields of West Virginia.

The company will have a saw mill of 150,000 feet daily capacity; a sulphite pulp-mill of 100 tons a day, and a standard guage railroad, connecting with the Atlantic, Quebec & Western Railroad. About 9½ miles of the railroad, including terminal trackage, have been completed, and it is now in operation into the timber limits, reaching Camp No. 1. The mills and town site are located on the northeast shore of the Grand Pabos bay and are ideally situated from an operating standpoint. The saw and pulp mills face each other on the sides of two adjoining hills. An arm of the bay runs between them and is being dredged to form a hot pond, into which the logs will be dumped, and drawn out by the two mills as required. The present equipment now on the ground consists of one 70-ton Shay locomotive, an American Locomotive Company direct drive line engine, five steel flat cars for logs, an American log loader, with steam shovel attachment, tug boat, barges, etc. Thirty additional steel log cars have been ordered.

NEW PATENTS

SURFACES OF CYLINDERS, ROLLS AND THE LIKE.

JAMES NUTTALL, Inventor.

U. S. PATENT No. 1,092,789.

This invention relates to improvements in doctors, or scrapers, for cleaning the surfaces of cylinders, rolls and the like (which I will hereinafter refer to as "cylinders") and has for its object to provide a rigid doctor, or scraper, which will have a very efficient cleaning effect, be self-sharpening and always retain a keen cutting, or scraping edge in use.

The present device may be properly used with printing cylinders or as a scraper for removing substances from cylinders of other nature, and I do not limit my invention to its use with any particular type of cylinder.

Referring to the accompanying drawing—Figure 1 is a side elevation, Fig. 2 a plan, and Fig. 3 a front elevation of one form of doctor, or scraper, according to my invention.

Fig. 1

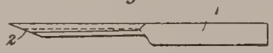


Fig 2

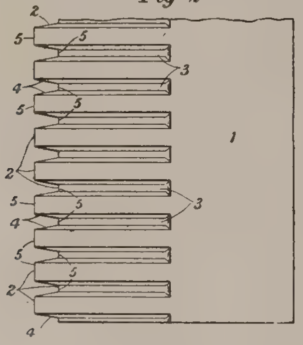
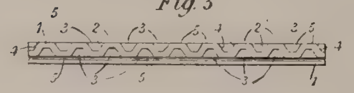


Fig. 3



According to my invention, I make the doctor, or scraper, 1, with the cutting, or scraping, edge, 2, continuous, but formed so that portions 5 thereof act upon the cylinder in different longitudinal lines parallel with the axis of the cylinder, and so that parts 4 which join the said portions also act upon the said cylinder.

My improved doctor, or scraper, 1, is made of metal, or other suitable material, and may be formed with grooves 3 therein, which are at right angles, or other suitable angle, to the axis of the cylinder, these grooves being preferably larger at the top than at the bottom, or vice versa, and being formed on one, or both sides, of the doctor, or scraper, and having any desired depth and shape.

In the accompanying drawing grooves 3 are shown formed in both sides of the doctor, or scraper 1.

The edge 2 of the doctor, or scraper, thus formed being bevelled, or cut or cast, on an incline, as shown in Fig. 1, will, when pressed against the surface of the cylinder, present thereto portions 5 which act upon the cylinder in different longitudinal lines parallel with the axis of the cylinder and parts 4 which also act upon the cylinder.

The parts 4 of the edge 2 of the doctor, or scraper 1, which join the portions 5 are preferably inclined to the direction of rotation of the cylinder as shown more clearly in Fig. 2 of the accompanying drawing so as to have a shearing action, which will be increased if the doctor or scraper, be caused to have a reciprocating motion across the surface of the cylinder, parallel with its axis, the doctor, or scraper, being thus reciprocated by any suitable reversing mechanism.

I wish it to be particularly understood that I do not limit myself to the precise formations of doctor, or scraper, shown in the accompanying drawing as it is obvious that modifications in the formation can be made without departing from the spirit and scope of the invention.

The doctor or scraper may be made of any suitable metal or alloy which should be sufficiently hard to always retain a keen cutting or scraping edge when in use as the wear on the bearing surface continues.

PULP STRAINER.

Theodor Qviller, of Lillestrommmen, and Hans Stub, of Christiania, Norway, Inventors

No. 1,092,389.

This invention relates to pulp strainers of the horizontal shaft type having a cylindrical or nearly cylindrical straining body and a centrifugal drum rotating inside the straining cylinder. It consists in improved means for distributing the pulp to the blades of the centrifugal drum from a central tube.

In pulp strainers used for straining cellulose it is important that the pulp be not beaten by the blades of the centrifugal fan, because knots and pieces of wood which are only partly digested should not be disintegrated. In pulp strainers hitherto known of the type referred to knots that are only partly digested are disintegrated by the beating.

In the accompany drawing a pulp strainer embodying our invention is shown.

Figure 1 is a vertical axial section through a strainer. Fig. 2 is a developmemnt of a portion of the inlet side of the fanbody showing the manner in which the distributing channels are arranged.

The general arrangement and constructional features of a strainer of this kind being so well known, it is sufficient for explaining the drawing to state that the shaft A carries a fan having blades B which may be radially, or nearly radially, disposed or they may have a somewhat curved shape, C designates the hub of the fan, and D a rim between which and the hub there is a curved body E. This curved body is preferably of a conical shape nearest the hub, and this cone enters a pulp feeding tube M, there being mounted in this tube an axially adjustable ring N, serving as a valve to regulate the flow of pulp into the strainer from the tube. The curved body E is provided with obliquely disposed ribs F, forming between them channels which lead the pulp from the cone to the blades, in such manner that the pulp is evenly dispersed to the blades. As the pulp is in this manner successively imparted the rotary motion and there is no sudden change in the direction of its flow, there will be no beating action of the pulp, but the fan will smoothly take it up and press it outwardly on the straining surface in a nearly tangential direction. The adjustment of the ring-valve N may be effected by a lever O, connected with the valve by means of rods P, and held in any desired position by means of the screw wheels R on the rod S.

Fig. 1.

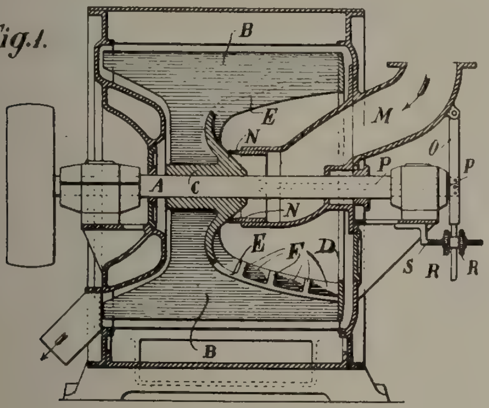
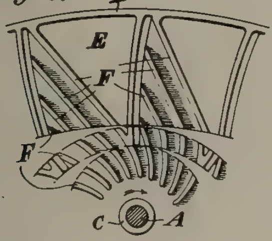


Fig. 2.



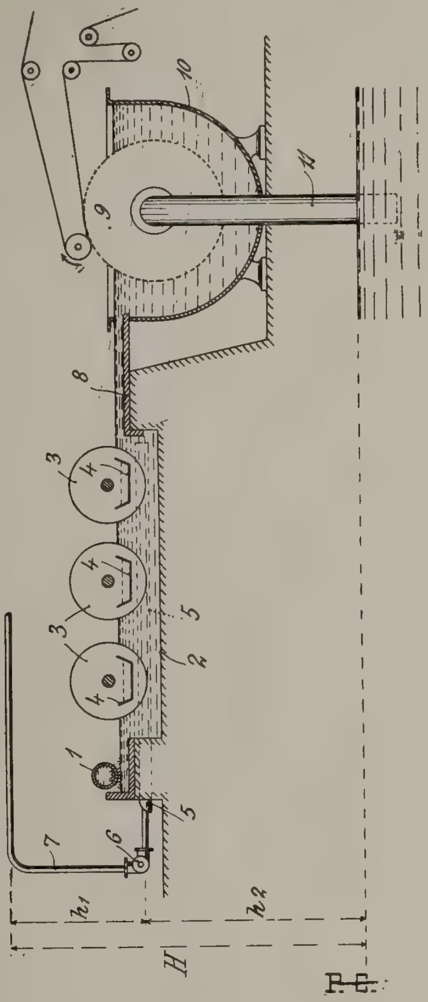
PLANT FOR REMOVING WATER FROM PULP IN WOOD-PULP MILLS.

By Peder Christian Schaanning, of Christiania, Norway.

U. S. Patent No. 1,094,378.

The objects of this invention are, to speedily remove water from the pulp, and to reduce the cost of erection and of maintaining a plant of the desired character.

The pulp discharged from the grinding apparatus is diluted with water, generally in the proportions of from 1 part of pulp to 500-700 parts of water. This has been a suitable condition or degree of dilution when the pulp is to be received on ordinary strainers operating without suction. Pulp of a materially higher degree of concentration will not be satisfactorily deposited on the wires of such strainers; it will coil up and fall from the wires. It has been found, however, that suction-strainers (those operated by or utilizing suction) are considerably more advantageous, in having a pulp-receiving capacity so much greater as to enable the pulp to be fed onto them at a degree of concentration up to 1 part of pulp to 100 parts of water without coiling itself or falling from the strainer. In taking advantage of this fact, I subject the pulp to the action of water-removing means, before the pulp reaches a suction-strainer. In the present case the water-removing apparatus may comprise a series or succession of strainers which remove a substantial portion of the water, reducing the proportions from 1-600 to, for instance, 1-100, in which latter conditions the pulp will then be subjected to the action of a suction-strainer, for a final water-removing operation. The resulting benefits are, considerable increase in the productiveness of the suction-strainers and reduction in cost of construction and of operation and for attendance.



Referring to the accompanying drawing, 1 indicates a pipe or chute, leading from the sorting apparatus and delivering pulp, in highly-diluted condition, to a basin or reservoir, 2. A number (shown as a series or succession) of water-removing strainers, 3, are shown as dipping into the diluted pulp in the basin. Cylindrical revoluble strainers are shown, and during the motion of the pulp past these strainers, each of the latter lifts large quantities of water, containing farinaceous pulp matter, and the water thus removed is caught in the chutes or troughs, 4, to be led off through a pipe, 5, to a pump, 6, destined to raise the water through a pipe, 7, preferably for re-use in dilution of pulp. The removal of water from the pulp by the succession of strainers, 3, gradually concentrates the pulp, so that, at the discharge end, 8, of the basin, the pulp may have reached a dilution of, for instance, 1 part pulp to 100 parts of water. In this concentrated condition, the pulp is fed or led into a receptacle, 10, for a suction-strainer, 9. The pulp freed from much farinaceous matter and water, quickly forms as a coat on the wire of the suction-strainer, to hold back farinaceous matter from a discharge pipe, 11. As a result, substantially pure water is discharged from the apparatus into a river or other point.

It is to be noted that the illustrated form of apparatus requires pumping of separated water only the distance represented by h^1, not the entire height represented by H—thus saving the power otherwise called for to raise the water the distance (from 3 to 5 meters) represented by H^2.

As an example of the comparative economy resulting from a plant made according to my invention, it is pointed out that a grinding mill employing ten ordinary strainers (known as "Gaara strainers"), with a productiveness of six tons, for removing water, requires five attendants per working period—or ten workmen in each twenty-four hours—while a plant of like capacity with the substitution of suction-strainers reduces the number of these to two for each working-period, or four for each twenty-four hours. In the first case, it is difficult for an attendant to manage more than two machines, requiring him to constantly walk to and fro to attend to them alternately, while in the second case, water-removing strainers require no attendance, and one workman cares for two suction-strainers. Additional economies are attained with respect to space and first cost, two pulp-making machines being required as against ten of the older kind, six water-removing strainers, in a common wooden box, and two suction-strainers, occupying less space and being considerably cheaper to construct and maintain than ten ordinary strainers in separate boxes. It is also obvious that the consumption of fittings (for instance, the consumption of felt) will be highly reduced. Another advantage resulting from this invention, in rebuilding old grinding mills, is that old strainers can be employed as water-removing strainers, reducing the rebuilding expenses much lower than if a large number of exclusively suction-strainers were required.

SULPHITE MANUFACTURE.

Various attempts have been made to utilise economically the substances contained in the waste liquor obtained by boiling sulphite cellulose. In boiling sulphite cellulose, more than the half of the weight of the wood is dissolved and carried away together with the liquor, and besides, large quantities of lime and sulphur are also wasted. From such waste sulphite liquor a plurality of substances have been produced. As far as can be ascertained all attempts to recover economically and extensively the constituents of the waste liquor have been unsuccessful, owing to the high degree of dilution of the waste liquor. It has only been possible to recover the fermentable kinds of sugar contained in the waste liquor for producing alcohol. The small percentage of substances (organic as well as inorganic) dissolved in the waste liquor has always been the most serious drawback to the economical utilisation of the substances contained in the waste liquor.

An invention, patented in the United Kingdom, by Mr. Evik Oman, of Stockholm, consists in using the waste liquor (instead of fresh water) for preparing fresh boiling acid by adding lime or magnesia or alkali and sulphur dioxide to the liquor, the boiling liquor thus obtained being used for another boiling of splinters. Of course, the waste liquor obtained in this manner contains about twice the amount of dissolved substances as the common waste liquor. The waste liquor thus obtained may be used anew for preparing fresh boiling acid, and by boiling with this acid a waste liquor i sobtained of a concentration about three times as great as that of common waste liquor, etc. In this manner a waste liquor may be obtained, without difficulty, being three to four times as concentrated as the common waste liquor, the incrustations being nevertheless extracted from the wood in a satisfactory manner.

The invention may be carried out in various manners. The following process is, however, to be preferred. When the waste liquor, by the use of old liquor for preparing fresh boiling acid, has attained the desired concentration, part of the said liquor is used for recovering the organic or inorganic substances contained therein, and the remainder of the waste liquor is used for preparing fresh boiling acid by adding further quantities of lime or magnesia or alkali together with sulphur dioxide. Besides waste liquor, a suitable quantity of the washing-water may preferably be used, said water being obtained by washing the pulp, or a suitable dilution of the concentrated liquor before using it for another boiling process. At the beginning of the process, before the waste liquor has attained the desired concentration, such a dilution is, of course, unnecessary.

The advantages of the present invention are firstly that a waste liquor of such concentration is obtained that an ecomonical utilisation thereof will be possible, and secondly that the quantity of the pulp obtained will be greater ,and finally ha the corroding influence of the boling liquor on the boilers and the conduits, etc, will be less than otherwise.

From the comparatively concentrated waste liquor obtained in this manner, the dissolved substances may be recovered either by first transforming the fermentable substances into alcohol and distilling the same, the remainder of the dissolved substances being then recovered by precipitation or concentration, or by first removing, wholly or partly, the dissolved not fermentable substances into alcohol which is afterwards distilled.

The present process is especially adapted for the manufacture of strong pulp or half-cellulose, because the extraction of the incrustations from the wood may in this process be regulated more easily than in the usual boiling of sulphite cellulose. In the latter process the acid affects, at the beginning of the boiling, the fibres of the cellulose as well as the incrustations, which involves a loss of celulose, and moreover, a part of the splinters will be dissolved completely, which is not to be desired. In this manner there are obtained incrustations to such an extent that they are capable of on the one hand fibres of cellulose totally freed from being defibrated. A pulp of this kind is not, however, homogeneous and, on account thereof, of less value. In using the present process the said disadvantages are obviated because the cellulose is not affected at the beginning of the boiling process, and besides it will be possible, by suitably adjusting the quantity of lime or magnesia or alkali relative to the quantity of wood, to control completely the degree of boiling, the pulp, moreover, being practically homogeneous

PULP AND PAPER NEWS

The Parsons Pulp & Lumber Company are installing 27 induction motors throughout the different departments of their pulp mill at Chandler, Que. These motors are being supplied by the Canadian Crocker-Wheeler Company. Our item in reference to this plant which appeared in the April 15 issue would make it appear that this equipment was supplied by another company.

Driftwood Lands & Timber, Ltd., has taken out an Ontario charter. The powers are very extensive among which are the right to carry on in all its branches a lumber, timber and pulpwood business, and to manufacture, produce, buy, sell and deal in timber, logs, lumber and wood of all kinds. The capital of the company, whose headquarters is in Toronto, is $150,000.

The British American Wax Paper Company, of Toronto, Canada, of which H. B. Hart, is manager, has increased its facilities by fifty per cent by taking in a large portion of another floor in the Darling Building. Three machines for waxing paper are kept constantly in operation.

Mr. C. C. Mendham who has been connected with the outdoor staff in Toronto of the Herbert Morris Crane Hoist Company, Limited, has now been appointed Resident Engineer in Berlin for the same Company. This appointment is in line with the well-known policy of the Herbert Morris Crane & Hoist Company which consists not only in carrying stocks of their manufactures to ensure prompt delivery, but in furnishing also a Consulting Engineering Service, which will advise on the best equipment for any given set of conditions.

The Journal of Commerce Publishing Company, Limited, of Montreal, has been recently incorporated with a capital of $500,000. This company will publish the "Daily Journal of Commerce" devoted exclusively to Commerce and Finance under the Editor-in-Chiefship of the Hon W.. S. Fielding.

We are glad to note that Mr. Arthur P. Tippit, head of the firm of that name in Montreal, is rapidly recovering from his recent severe illness. Mr. Tippit is now able to be around, and expects to get back at work in a short time. His many friends in the industry will be glad to hear this good news.

W. D. Gregor, mill manager for Price Bros. & Co. Ltd., at Kenogami, Que., has resigned, and will leave Kenogami shortly. The wood room of the Kenogami mill has been completely re-arranged, and other extensive alterations carried out

Extensive improvements and alterations are being made to the plant of the Jonquiere Pulp Co.

Alex. Annandale, who has been temporarily engaged with Price Bros., at Kenogami, on efficiency work, has completed his work there.

C. F. Beyerl, who recently resigned as secretary of the Hammermill Paper Co., of Erie, Pa., was in Toronto and Montreal lately looking over the situation here. We understand that Mr. Beyerl contemplates entering the Canadian field as a manufacturer of writings and bond papers.

The Toronto Paper Manufacturing Co., whose mill at Cornwall has been closed down while new retaining walls were built at Locks 19 and 20 on the Cornwall Canal, resumed operations last week, the plant being given a thorough overhauling

The lumbermen of Toronto have taken steps to form a club and secure permanent quarters. Committees have been formed and it is expected that definite arrangements will be concluded in a few weeks.

P. L. Colbert, one of the city salesmen of the St. Lawrence Paper Mills, Toronto, has been removed to London, Ont., where he will have his headquarters. He is a brother of E. R. Colbert, Managing Director of Gummed Papers, Limited, Brampton.

The Workmen's Compensation Act, which has been before the Ontario Legislature for some time has passed its second reading with some few amndments and it is expected that the measure will soon become law.

John A. McAndrews of Toronto,, has issued a writ against F. H. Anson and Shirley Ogilvie of Montreal, for account of profits due under an agreement of commission on sale of stock in the Abitibi Pulp and Paper Co. and interest on certain amounts.

Extensive improvements are being made to the building of the Riordon Pulp and Paper Co. at Merritton, Ont. New cement floors are being laid, the roof on the former paper mill portion of the plant is being renewed and the four digesters relined.

Figures have been compiled showing that the united port of Port Arthur-Fort William leads the Dominion in tonnage values and is the fourth on the American continent The head of the Great Lakes is sixty million dollars ahead of Montreal, her nearest Canadian rival. In the receipts and shipments last year there were 102,000 tons of lumber and pulp wood valued at $840,000.

The Department of Lands, Forest and Mines of the Province of Ontario has declined to supply any of the Opposition members in the Legislature with confidential information in regard to the timber found on the townships of Thistle and McWilliams, the two townships sold last year to lumbering companies, or eight timber berths in all. In the Public Accounts Committee recently, with Deputy Minister Aubrey White on the stand, an effort was made to find out what estimates the department had received on the timber before selling the berths. Mr. White refused to answer on the ground that the Government considered the information confidential and that it would be unfair to the purchasers to make known the figures. Hon. Mr. Hearst upheld Mr. White in the position that he took, and declared that the Government had got a good price. The exposed condition of the timber under discussion and the damage to it from fire had been one of the reasons for making the sale. The Minister pointed out that the timber in the berths was defective and that it was proving even worse than it was thought to be. He contended that the Government had made a good bargain.

Eighty thousand acres of land adjacent to the Grand a large proportion bordering on the railway, will be opened to pre-emption in the valley of the south fork of the Fraser River in June, according to the announcement recently made by Hon. Wm. R. Ross, Minister of Lands in British Columbia. When the work of building the Grand Trunk Pacific Railway was begun, the valley, which contains a large amount of agricultural and wooded lands was placed in reserve. The main industry of a great part of the valley, other than farming, will be lumbering, and this should reach considerable proportions. There is a large amount of good timber. A large mill with maximum daily capacity of 100,000 feet has been built by the Upper Fraser River Mills Company near Dome Creek.

Herman Henry Cook, well known as a wealthy lumberman and formerly a member of Parliament, died at his home in Toronto on Monday, April 13. He was born in 1837 in Dundas county and entered the lumber business in 1858 when he secured extensive limits in the Georgian Bay region and built one of the largest sawmills in the Dominion at Midland City. Later he became president of the Ontario Lumber Company.

The Dominion Pulp Co. at Chatham, N.B., have reopened after entirely rebuilding their plant. All the useful machinery of the old Mirimichi Sulphite Fibre Co. was used, and a new Pusey & Jones drying machine installed. A new Barker acid system was also installed.

The Maple Leaf Lumber Co. has been granted a charter. The head offices are in Toronto and the capital stock is $40,000. Among the powers of the company are those of developing lumbering, mining and farming properties. Other charters which have been issued recently are to the Industrial Publishing Co., with a capital of $150,000, and headquarters in Toronto, to carry on the business of printers, engravers and publishers, the incorporators being P. E. Hambly and F. P. Hambly, W. E. Hunter, A. K. Goodman, and Lionel Brayley, all of Toronto; and the Multipress Company, also of Toronto, with a capital of $60,000.

A large number of experienced rangers have been engaged by the Ontario government for fire protection duty during the coming summer, and have commenced their work. Students are practically cut off this year from the service as fire rangers owing to the rigid regulations, which have gone into force. The Department of Lands, Forests and Mines decided that no student should be taken on who was not available by May 1st. This has shut out all the arts and medical boys of the University of Toronto, many of whom for years past have found steady employment for several months in the bush. Only a few students in Science have been able to get away in time and this year a relatively small number of applications were received from the young men at the University.

A large deputation waited upon the Ontario Government last week, representing the Timiskaming, Sudbury and Nipissing districts to urge the immediate extension of the Elk Lake branch of the Timiskaming and Northern Ontario Railway to Gowganda. Provision has been made in the estimates for this extension and, now that a satisfactory location has been found, it is likely that the work will be proceeded with and not stop at Gowganada, but continued to Sudbury, where a working connection will be secured with western lines.

The Victoria Paper and Twine Co. have completed the removal of their large store to the Victoria building at 439-441 Wellington Street West, Toronto. Manager Charles V. Syrett and staff are now comfortably installed in the offices on the first floor, which are finished in oak in attractive style, with departments for salesmen, sample rooms, accounting, etc. The manufacturing department of the company, The Victoria Paper Goods Co., will also be installed in the new building later on. The structure represents the last word in stock piling advantages, space economies and shipping facilities.

The Jonquiere Pulp Co. have shut down their sulphite mill entirely. They are taking their supply of sulphite from the Kenogami Mills of Price Bros., one and a half miles distant. The new sulphite mill at Kenogami is larger than the requirements of the two mills, hence Price Bros. intend putting on the market about 10 tons of pressed sulphite pulp.

The Belgo-Canadian Company is installing a fourth machine, which is 202 inches wide and will increase its news output to 170 tons per day Its new 60-ton sulphite plant, which is nearing completion, will be in operation early this summer. A new Barker tank and tower system for acid making is being installed.

The premises of the Alberta Lumber Co., Vancouver, B.C., were damaged by fire to the extent of half a million dollars on April 18. The yards contained a very large quantity of lumber at the time.

EUROPEAN NOTES

(Specially translated from late numbers of foreign Trade Papers).

BAMBOO FOR PAPER MANUFACTURING

According to a report received from Taipeh, Formosa, the local paper mill, where bamboo was used instead of wood pulp, has been found to be a complete failure.

Although ample and sufficient capital was provided, the company decided to shut down the mill since the manufacturing of paper from bamboo, on account of entirely too heavy losses, proved to be a hopeless task. Most of the help secured from Japan has been sent back to their native country, and but a few remained to continue with work of an experimental nature. It was claimed that the high costs for manufacturing paper from bamboo caused the mill to be a financial loss.

While a detailed report of the Taipeh plant and its process would no doubt be of interest, this single case of a failure in making paper from bamboo cannot be looked upon as a criterion.

NEWS

Sweden and Norway are affected by the generally prevailing business depression in British paper mills. The demand for chemical and ground wood pulp in British mills is somewhat slack and not up to the brisk point usually experienced at this time of the year.

Norway's exports of ground wood and chemical pulp were as follows:

	Ground Wood.		Chemical Pulp	
Jan.-Nov.	dry tons.	wet tons.	dry tons.	wet tons.
1913	16,535	452,651	191,848	2,403
1912	19,480	455,426	197,246	1,296
1911	18,098	400,763	175,204	2,898

The Swedish exports during the time from January to December were as follows:

Jan.-Dec.	Ground Wood. dry tons.	wet tons.	Chemical Pulp. dry tons.	wet tons.
1913	17,437	488,131	212,252	2,465
1912	22,285	504,409	220,060	1,337
1911	19,677	436,463	197,600	2,898

Finland's paper industry is still working under rather favorable conditions. The figures for exports in paper goods continue to increase. A decrease in exports of pulp is due to the fact that in 1913 several ground wood mills entered the box board field.

Austria-Hungary is as yet laboring under a general depression, and the outlook for the near future is not very bright. The prevailing overproduction caused an increase in exports, however, on account of the very keen competition on the foreign markets prices are rather low. The Austrian-Hungarian Paper Manufacturers Syndicate succeeded in obtaining special rates from the railroads and steamship companies.

In Germany the paper industry is fairly busy. Prices for pulp wood are still firm, while paper, generally speaking, sells at a small profit.

WOOD BLOCK FLOORS

When heavy materials like pulp wood, wood fuel, wood refuse, planks, castings and similar articles are thrown or dumped on floors you will soon find that concrete floors wear away very quickly, often get smashed up and disappear piece by piece.

Ordinary wooden floors also stand only for a few years.

Here, a floor that can stand wear and tear and is not too expensive in first cost and upkeep is most essential.

Wooden blocks, 6 to 9 ins. long and say 3 x 9 or 4 x 8 ins., of a tough wood makes a good floor.

An ordinary concrete floor is laid, but not necessary smoothed.

Well dried wooden blocks are soaked in hot creosote or wood tar, and placed in rows on end on the well dried concrete floor. Care should be taken that the blocks are well fitted together, that the rows are laid in line, like in brick work, and overlap each other, and also that every row is well filled and the last block well fitted and pressed down.

In dry places, or in cases where the blocks are not well dried, a coat of tar should be given a few months after the floor is laid, in order to fill in the spaces between the blocks and prevent them from getting loose and coming out.

A coat of tar immediately after the floor is laid is desirable, but not necessary.

In case where decoville railroads are used to convey materials to and from the different departments, old tramway rails are laid down on the concrete floor and the height of the wood blocks made the same as the height of the rail from concrete floor to rail top. This makes a floor on which decoville cars as well as trucks can be run.

Most saw mills get in their operation planks, which are not fit to be sold as such, but which can be cut up into sound wood blocks of accurate dimensions.

Those saw mills will undoubtedly be only too pleased to cut up otherwise waste material into floor blocks and sell them at a reasonable price.

NOTES ON ESPARTO GRASS

The Journal of the Society of Chemical Industry:—The Esparto plant grows best on mixed limestone and gravel soils; its natural region lies between 32° and 41° N. latitude, but it is capable of resisting considerable variations in temperature and is found at altitudes up to 3,000 ft. The last ranges in length from 30 to 70 cm., attaining 1 m. under exceptional circumstances. It is pale green when growing but becomes yellow on drying; it rolls up under the influence of dryness, attaining its cylindrical form at the ripening stage.

About 200,000 tons of the grass are imported almost exclusively by England; the quantity has remained stationary for fifteen years, a decline from one source being made up by increased importations from other sources. If the leaf is harvested before maturity the quality of the fibre is very inferior, yielding a semi-transparent paper. In most districts the use of the knife is forbidden; a tuft of grass requires 8 to 15 years before it becomes productive, and may then be "pulled" annually for 30 to 50 years. The best time for pulling is the autumn; in most countries a close-season is fixed by regulation during the earlier months of the year.

The harvested grass is stored and dried for a considerable time before packing for shipment; the hydraulic pressed bales weigh about 22½ lbs per cub. ft.

The majority of German papermakers are not interested in the grass; partly through unfamiliarity, partly owing to difficulties in procuring freights. Freights from Algiers and Oran run about 28s. per ton for Hamburg and 24s. for English ports.

The area under esparto in Algeria is about 2,800,000 acres, of which about three-fourths are in the department of Oran. Regulations as to season of cropping are in force, also certain zones are reserved as a protection against sand troubles.

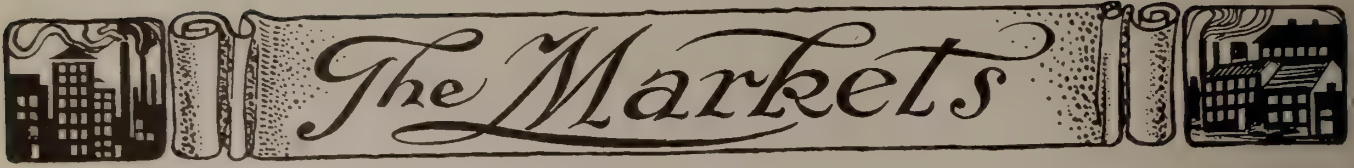
Exports from Algeria were 100,788 tons in 1911 and 116,632 tons in 1912, average price 52s. per ton; exports from Tunisia were 50,797 tons in 1911, average price 57s. per ton. Increases from these countries in recent years have taken place at the expense of the Tripoli trade, now practically ruined by war and scarcity of labor.

The Spanish variety of esparto is still the most valuable, although high prices and careless industrial habits have led to wasteful methods of cropping. Exports have declined from about 60,000 tons in 1897 to 41,000 tons in 1912, but the fluctuations since 1904 show a fairly steady average; the price runs about 95s. per ton and has fallen from more than double this figure since 1883.—Tropenpflanzer.

BIG TIMBER DEAL

The Chicoutimi Pulp Co. has just purchased from the Atlantic, Quebec and Western Railway 400,000 acres of freehold pulp wood lands, which was formerly given to the railway for the construction of 100 miles of railway line, extending from New Carlisle to the Gaspe Basin. This great area is located along the branches of the Upper Peribonka River.

The total area of freehold pulp wood lands now possessed by the Chicoutimi Pulp Co. amounts to 51,000 acres in their perpetual right, besides 436,000 acres of leasehold lands.



The Markets

Canadian Markets

The conditions in the news situation remain fair, and, in the general quiet tone of the trade, print paper plants are standing the strain best. The war between United States and Mexico will, of course, add materially to the demand for news print as many papers already report a large increase in circulation. There is nothing that causes newspaper readers to multiply in all parts of the country so rapidly as hostilities between nations Book and writing plants are marking time for the most part printers are quiet with a few exceptions, and, when publishing houses are not rushed the sale of many kinds of paper suffers. The wrapping paper situation is very dull and it is said that mills are accepting orders at very low prices from jobbers in order to keep the machines running. Users of wrappings of all kinds are buying in limited quantities and are taking every precaution to see that they do not get stocked up. There have been some heavy sales of Kraft on the Toronto market during the past few days at $2.60 and $2.75 in order to clear out certain surplus products. The consignment was quickly snapped up. Ground market conditions remain unchanged and there is very little business, most of the shipments being made on contract. Prices remain at $21 to $23 delivered, according to freight rates and destination. The demand for sulphite pulp continues fair, and there are no large stocks on hand in Canada. As the weather gets more seasonable the demand is better. In some of the Western States the mills are already suffering from low water. Prices for unbleached sulphite remain at $42 to $44 delivered, and for bleached the quotations run from $55 to $58 delivered. The rag and paper stock market is dull and mills are not purchasing in any large quantities. The outlook is fair but in all lines of paper and pulp the present summer will it is thought, not be nearly as active as last summer. While orders are numerous in certain lines they are small and it is quantity orders which count and keep mills going remuneratively. When the runs have to be changed frequently and different weights and widths and colors made it is much more difficult to operate the plants profitably six days and nights in the week.

Quotations f. o. b. Toronto:

News (rolls $1.95 to $2.00 at mill in car load lots.
News (sheet $2.10 to $2.20, at mill in carload lots.
News (sheet) $2.25 to $2.50, depending on quantity.
Book papers (carload) No. 3, 3.75c to 4.25c.
Book papers (ton lots) No. 3, 4c to 4.50c.
Book paper (Carload) No. 2, 4.25c.
Book papers (ton lots) No. 2, 4.50c to 5.25c.
Book papers (carload) No. 1, 4.75c to 5.25c.
Book papers (ton lots) No. 1, 5.25c to 6.00c.
Writings, 5c to 7½c.
Sulphite Bond, 6½c to 7½c.
Grey Browns, $2.00 to $2.75.
Fibre, $2.75 to $3.50.
Manilla B.,$2.50 $3.25.
Manilla, No. 2, $2.75 to $3.50.
Manilla, No. 1, $3.25 to $4.00.
Unglazed Kraft, $3.75 to $4.50.
Glazed Kraft, $3.90 to $4.75.

Pulp.

Ground wood (at mill), $15 to $15.50.
Ground Wood, $21 to $23, delivered in United States.
Sulphite (unbleached), $41 to $43, delivered in Canada.
Sulphite (unbleached), $42 to $44, delivered in United States.
Sulphite (bleached), $55 to $57, delivered in Canada.
Sulphite (bleached), $56 to $58, delivered in United States.

Paper Stock.

No. 1 hard shavings, $1.87½ to $1.90, f.o.b., Toronto.
No. 1 soft white shavings, $1.75.
No. 1 mixed shavings, 50c.
White blanks, 92½c to 95c.
No. 1 Book, 5¼c to 6c per lb.
No. 2 Book, S.C., $4.50 to $4.75 in large quantities; to $50 per ton for small orders.
Ream News, $45 to $47 per ton for large orders; $50 to $60 per ton for small orders.
Heavy ledger stock, $1.40 to $1.50.
Roll News, $40 to $43 per ton for large orders; $45 $4.75 to $5.50 in small quantities.
No. 3 Book, M.F., $4.00 to $4.25 in large quantities;
Ordinary ledger stock, $1.15 to $1.20.
No. 2 book stock, 45c to 50c.
No. 1 book stock, 75c.
No. 1 Manilla envelope cuttings, $1.10 to $1.15.
No. 1 print Manillas, 60c.
Folded news, 45c to 50c.
Over issues, 50c to 52½c.
No. 1, Clean mixed paper, 25-30.
Old white cotton, $2.50 to $2.75.
Thirds and blues, $1.30 to $1.32½.
No. 1 white shirt cuttings, $5.00 ta $5.25.
Blue overall cuttings, $3.50 to $3.60.
Black overall cuttings, $1.75.
Black linings, $1.75.
New light flannelettes, $4.75.
Ordinary satinets, 75c to 80c.
Flock, 90c.
Tailor Rags, 70c. to 75c.

Quotations f.o.b. Montreal are:—

Book and News Paper.

Roll News, $40 to $43 per ton for large orders; $45 to $50 per ton for small orders.
Ream News, $45 to $47 per ton for large orders; $50 to $60 per ton for small orders.
No. 1 Book, 5¼c to 6c per lb.
No. 2 Book, S.C., $4.50 to $4.75 in large quantities; $4.75 to $5.50 in small quantities.
No. 3 Book, M.F., $4.00 to $4.25 in large quantities; $4.40 to $4.50 in small quantities.
Writings, 5c to 7½c.
Sulphite Bond, 6½c to 8½c.

Wrappings.

Grey Brown, per 100 lbs., car lots, $2.25 net; 5 tons $2.45; 2 tons, $2.55; 1 ton, $2.65; less, $2.75.
Red Brown, car lots, $2.85; 5 tons, $2.95; 2 tons,

$3.05; 1 ton, $3.15; less $3.25.
B. Manilla, car lots, $2.85; 5 tons, $2.95; 2 tons, $3.05; 1 ton, $3.15; less, $3.25.
No. 2 Manilla, car lots, 3.10; 5 tons, $3.20; 2 tons, $3.30; 1 ton, $3.40; less, $3.50.
No. 1 Manilla, car lots, $3.25; 5 tons, $3.45; 2 tons, $3.55; 1 ton, $3.65; less $3.75.
Kraft, $3.75 to $5.00.
Fibre, car lots, $3.25; 5 tons, $3.45; 2 tons, $3.55; 1 ton $3.65; less $3.75.

Most of the manufacturers are quoting 10 per cent. less than the above prices to the jobbing trade on the cheaper lines of wrapping, such as B. Man., No. 2 Man.—grey and red browns.

Pulp.

Sulphite easy bleaching, $43 to $45 per ton.
News quality, $41 to $42 per ton.
Bleached sulphite, $54 to $59 per ton.
Kraft pulp, $3.60 to $4.00.
Ground woods, No. 1, $15 to $16.
Ground wood, No. 2, $22 to $24, delivered United States.

New York Markets

(Special to Pulp and Paper Magazine).

New York, April 25, 1914.

There has been no change in the general condition of the chemical pulp market. Advices from Scandinavia show that there is a plentiful supply of sulphite for export. The present low quotations just about meet the cost of production, and if prices go any lower serious difficulties at the pulp mills are likely to follow. Bleached sulphite is moving normally on contract lines, but new orders are few and slow to mature. Unbleached sulphite is quiet, but importers are holding out for the market price. Paper mills are delaying in their contract arrangements for a lower price. This is hardly probable, as there is no profit for the pulp makers even at present. The condition of bleached sulphite is such that a short time contract can be closed at a lower figure than one for a long period. Sulphite and soda have been quiet during the interval, activity being confined to shipments for consumption in contract channels. The spot market for Kraft pulp has been fairly strong and a short supply on this side is reported. In the interval a few good-sized contracts were closed, but the spot market reflected a quieter tone.

A number of grinders have contracted for more mechanically ground wood pulp than their plants can produce during the year. This was done in anticipation of some losses during the summer months when some mills may request that shipments be suspended. At present heavy shipments are being made on contract orders due to the heavy consumption of newsprint paper. Plentiful supplies of water have greatly enabled manufacturers in the grinding of large quantities of timber. The price is unchanged at present, no contracts being closed in the local market under $16.50 a ton at the mill for Number 1. There is a hopeful feeling here that the year will be good for ground wood.

The rag stock market has been fairly active along contract lines. The greatest volume of business has been in the lower grades. Roofing stock has been in fairly good demand and values are firm with an upward tendency. Bagging in all grades has reflected a quiet tone and there has been a softening in the price of old gunny. Advices from Calcutta show a shortening of the raw material for jute twines, which are high in price and are likely to go still higher.

The old waste paper market has been fairly active in the interval and large shipments on contract have been made to mills using all grades. Soft and hard white shavings continue to hold firm values and the difficulty is to get stock to supply the fairly strong demand. A good demand for overissue news has been felt among the local trade and prices are well maintained. Strictly folded news has been in active inquiry at prevailing quotations. Mixed papers are fairly active, but prices are not likely to tower to the heights of a year ago:

Pulp.

Ground Wood, No. 1, $20 to $24, delivered.,
Ground Wood, No. 2, $15 to $17, delivered.
Uubleached sulphite, dom., 1.90c to 2.20c delivered.
Unbleached sulphite, imptd., 1¾c. to 2c. ex dock, New York.
Bleached sulphite, demestic, 2.80c. to 3c delivered.
Bleached sulphite, impt., 2.70c. to 2.95c., ex dock, New York.
Easy Bleaching, impt. 2.05c to 2.20c ex dock, N.Y.
Unbleached sulphite, impt., 1.80c. to 2.10c., ex dock, New York.
Bleached sulphite, impt., 2.60c. to 2.80c., ex dock, New York.
Kraft pulp, impt., 1.80c. to 1.95c., ex dock, N.Y.
Soda pulp, dom., 2.15c. to 2¼c., delivered.

Paper

General business conditions in this vicinity are only fair. Banks have large accommodations of money which is found difficulty to loan. The rate for call money is lower than it has been for some time. Collections on outstanding accounts have been fairly good. The general tone of the paper market is one of hand to mouth buying. While mills are running fairly full, the volume of orders is not large enough to warrant investment in plants to any extent. The latter part of the interval reflected an atmosphere of extreme indifference due to the Mexican situation. Numerous extra editions and larger distribution of regular editions of local newspapers have done much to cut down the surplus tonnage of newsprint paper. High water has caused certain mills to shut down. Difficulty was met, in some instances, in making deliveries. There is no change as yet in the price of newsprint, but a rise must necessarily result from the present strong demand. How much the value will increase is guesswork, but that it will increase is admitted by all. The transient business has been much more active than for some time. Manila and fibre papers have been rather quiet, but there is at least a state of hand to mouth buying all the time. The demand for book paper is increasing and values reflect an upward tendency which will materialize into an increase in the near future. Coated book has shown some improvement in the local market. Tissues have been fairly active in all grades, but the price is still very low and the feeling is that few mills are realizing any but small profits. Kraft papers are still low in price and the demand for them is rather quiet. Paper specialties such as cover papers are in brisk movement and the last month has shown more business than for the same time last year. Every month has shown fairly good gains in the specialty market over the corresponding period last year and values are firm. Writings, bonds and ledgers are fairly active, especially the medium grades and prices are firm in all grades. Paper bags are in poor demand, but there is no price cutting on the new lists. Paper towels and toilet papers are in good demand at prevailing prices. Cigarette papers still reflect an active tone with firm values. A number of board mills have advanced the price of newsboard to $31 a ton, and it is likely that more will come up to the same price.

News, rolls, transient business, $1.95 to $2.05 f.o.b.
News, rolls, contract renewals, $1.95 to $2.00 f.o.b.
News, side runs, $2 to $2.10 f.o.b. mill.
News, sheet, $2.25 to $2.30 f.o.b. mill.
Book papers, car lots, M.F.S., $3.75 to $3.90 f.o.b.
Writing paper superfine, 13½c to 17c, del. east of Miss. River.
Writing paper, extra fine, 11c, del. east of the Miss. River.
Writing paper, No. 1, fine, 9c, del. east of the Miss. River.
Writing paper, No. 2, fine, 8c, del. east of the Miss. River.
Writing paper, engine sized, 4½c to 8c, del. east of the Miss. River.
Bond paper, 5c to 24c, delivered east of Mississippi River.
Ledger paper, 8c to 30c, delivered east of Mississippi River.
Linen paper, 7c to 18c, delivered east of Mississippi River.
Manila jute, 4¾c to 5¼c, delivered.
Manila, wood, $2.40 to $3.00, delivered.
Kraft, No. 1, $3.50 to $3.75 f.o.b. mill.
Kraft, No. 2, $3.25 to $3.50, f.o.b. mill.
Boxboards, news, $30 to $33 per ton, delivered.
Boxboards, chip, $28 to $31 per ton, delivered.
Boxboards, straw, $28 to $31 per ton, delivered.
Wood pulp board, $42.50 to $45 per ton, delivered.
Tissue, white, cylinder, 40c to 42½c, delivered.
Tissue, fourdrinrie, 47½c to 50c, delivered.
Tissue, jute Manila, 40c to 42½c, delivered.

British Markets

(Special to Pulp and Paper Magazine.)

London, April 21, 1914.

A slight improvement in the British paper trade is now to be reported. This change is not on export account solely, but in the consumption of the domestic supply. Some of the large printing houses in London and the provinces are busily engaged, and consequently there is a good outlet for fine printing paper, writing, and coated papers of all kinds. Newsprint and cheap grades of paper usually imported, together with packing and wrapping papers, are being purchased in large quantities, which may, in a small degree, help to relieve the stocks at mills and warehouses. The export trade of the products of the British mills is not altogether satisfactory, but it is anticipated that another few weeks may bring a sudden change and so relieve the dullness and lifeless condition of business that has prevailed since the beginning of the year. Paper manufacturers believe that the present bad trade cannot last much longer, and they are hoping for the best. Some mills are still running on short time, and it is quite evident, from what one can hear amongst the agents, that stocks all round have been accumulating to an enormous extent. That, of course, means that some time must elapse before things are levelled up to their normal condition. The Easter holidays also helped to knock business back. Manufacturers continue to be firm in their prices, and are against giving concessions if there is the slightest loophole to escape them. From Scandinavia, Germany, and Finland reports reach London that the paper industry in those countries is still in a bad way for new business.

* * *

The dullness in the paper trade caused Scandinavians during the first couple of weeks in April to become nervous, and, as a result, they let down the prices of sulphite considerably. This had a material effect on the British market, and London and Manchester importers of pulp complain that the action of the Swedish mille was quite unnecessary. From a papermakers' point of view, it is difficult at the time of writing to say what new buying the low prices will produce, but so far the market shows very little change both in sulphite and sulphate. Of course, the mills in England and Scotland are fairly well stocked with pulp, but the slight revival in the paper trade and the attraction of further low prices may turn out favorable for producers of sulphite and sulphate. Should there be any signs of paper manufacturers coming into the market, it may be taken for granted that prices will at once be stiffened:

Prices are now about as follows, c.if. British ports:

Bleached Sulphite	$56.00	to	$57,00
Easy Bleaching Sulphite (No. 1)..	30.40	to	40.00
News or strong quality	36.00	to	37.00
Unbleached soda (No. 1)	36.00	to	39.00
“ “ (Strong quality)..	36.60	to	36.90
Soda Kraft	33.00	to	36.00

* * *

Mechanical pulps are slow in moving, and prices have changed in favour of buyers. The same story comes from Scandinavia, where the state of trade is bitterly complained about. English buyers, though making enquiries about prompt parcels, are slow about entering the market. Prices are now down to what they were in December last, and are in England:

Pine 50 p.c. moist, prompt (unwrapped $9.00 to $9.80
Pine, dry, prompt .... 19.20 to 19.50

For forward delivery add about half a dollar to above prices for wet mechanical. All prices c.i.f., British ports.

* * *

The chemical trade is not enjoying a good period owing to the want of more business in the paper and textile industries. And what is more remarkable is the large decrease in the exports for March, which show that trade is not very bright in other countries. Bleaching powder is quoted $28 to $30; Caustic soda, $48 per ton for 76 and 77 per cent.; Sulphur, $26 per ton; Salt cake, $10.20 per ton; Ammonia alkali, $19.20. Sizing is unchanged in prices, and rosin is quiet and cheaper.

* * *

Esparto is still dear and firm, and, from all accounts, there is no likelihood of a reduction in values in the near future. Rags of all grades, old and new, are keeping quiet, but so far prices have not been changed in any way. Rag sellers are beginning to complain of the dullness, but it is quite evident that they will soon experience a revival in trade.

The Rotary Strainer

In many articles published about rotary strainers exact information about the speed of rotation and the area of the strainer is lacking. No cut and dried predetermined speed or superficial area can be prescribed. Both depend solely on the kind of the wholestuff and on the magnitude of the output. When the output is increased the speed may be increased, or the strokes per minute of the cam-wheel may be increasd. This has a limit, however, and frequently the erection of sesveral strainers cannot be avoided, for if the sorting is done with too great force the danger is increased of impurities and knots being driven through the cylinder and passing into the paper.

1. In a strainer comprising a rotating and simultaneously vertically shaken cylinder and in which the pulp passes from the inside outwards the superficial area, speed, width of slots and dilution of pulp must be adapted to the quantitative and qualitative output.

2. Rotating, non-shaken cylinder, and pulp driven through by means of cam-faces from the outside towards the inside. This system is satisfactory for higher grades and therefore better than 1, because the danger of knots or non-dissaggregated parts of the pulp passing through the slots is diminished, which may occur in system 1, even when the slots are 0.5 m|m wide. On the other hand, the maintenance costs of this system are somewhat greater.

3. Pump strainers, in which the pulp is sucked from the outside inwards by means of a suction pump through a slowly rotating four-sided prism of slotted plates. These require expensive maintenance and entail large loss of time for cleaning the apertures.

A suitable modification of system 2 consists in the rotating non-shaken cylinder driven slowly being made very large, the pulp likewise passing from the outside inwards. In addition, however, the strainer alone is no guarantee for a perfect paper. Scrupulous cleanliness, correct treatment of the raw pulp, etc., must relieve the sorting work as much as possible. That strainer must be considered the best which obtains the largest output with the smallest attendance and consumption of power.—Der Paper Fabrikant.

AUCTION SALE OF TIMBER LIMITS

Re:- H. M. PRICE & CO.

Lumber Merchants, Quebec, Insolvent.

PUBLIC NOTICE is hereby given that on **WEDNESDAY, August 5th, 1914, at 10 o'clock A.M.,** the Timber Limits hereinafter mentioned will be offered for sale by Auction without reserve, at the office of Messrs. LaRue & Trudel, Accountants, Dominion Building, 126 St. Peter Street, Quebec:—

			Sq. Miles.
License	No.	181 River St. Jean Br. East No. 1	22
"	"	182 River St. Jean N.E. Branch No. 2	18
"	"	183 River St. Jean East Branch No. 3	20
"	"	184 River St. Jean, No. 7	12
"	"	185 River St. Jean, No. 8	12
"	"	186 River Saumon & Tribut River St. Jean	34
"	"	187 River Magpie, No. 3	32
"	"	188 River Magpie, No. 4	32
"	"	189 River Magpie, No. 5	32
"	"	190 River Magpie, No. 6	32
"	"	191 River Magpie, No. 7	32
"	"	192 River Magpie, No. 8	32
"	"	193 River St. Jean, No. 1	24
"	"	193 River St. Jean, No. 2	24
"	"	194 River St. Jean, No. 3	23
"	"	195 River St. Jean, No. 4	18
"	"	196 River St. Jean, No. 5	20
"	"	197 River St. Jean, No. 6	20
"	"	198 River Magpie, No. 1	32
"	"	199 River Chambers, No. 1	56

A total of 527 square miles more or less. Also a certain area of freehold land to be used as a mill site and fully described in deeds in the hands of the undersigned curators.

Conditions of Sale:—Ten per centum cash on adjudication, the balance payable upon transfer of the licenses, which transfers will have to be made at once, the transfer fee to be payable by the purchasers.

The purchaser will pay in addition to the purchase price, the auction duty of one per cent and will accept the licenses as they are without any responsibility on the part of the estate as to the condition, area or quality of the limits.

For inspection of the licenses and other particulars please apply to the undersigned:—

A. F. C. ROSS (Messrs. P. S. Ross & Sons),
142 Notre Dame St. West, Montreal.
EUGENE TRUDEL (Messrs. LaRue & Trudel),
Edifice Dominion, 126 St. Peter St., Quebec.

QUEBEC WHARFAGE AND STORAGE CHARGES ON WOOD AND PULP.

New wharfage and storage charges have been fixed by the Quebec Harbour Commissioners in a new set of by-laws which they passed, and which were approved by the Government at Ottawa recently. It is provided that lumber, timber and wood pulp for export will be free of wharfage charges, while pulpwood will be charged at the rate of 12 1-2 cents per cord. The storage charges will be as follows: On timber, lumber, pulpwood, ties, etc., per square of twelve feet, $1 per square per month or part of a month.

THE CANADIAN FORESTRY CONVENTION

The following letter relating to the convention of the Canadian Forestry Association, to be held in Halifax in September, has been sent out to the members of the Association:

To the Members of the Canadian Forestry Association:

It has been decided upon the invitation of the Government of Nova Scotia and the lumbermen of that Province, to hold the next Canadian Forestry Convention in Halifax, N. S., on September 1st to 4th, 1914.

This will be the first Canadian Forestry Convention ever held in Nova Scotia. The need for increased information and interest is great, and from present indications it is believed this will be one of the most useful and practical conventions yet conducted by the Association. A number of prominent administrators, lumbermen and forestry experts have already announced their intention of taking part.

Railway arrangements for all points in Canada, both east and west of Port Arthur, are nearing completion. Favorable rates are expected, of which particulars will be furnished upon application to the secretary. These rates will be available to members of the Association attending the sessions, and their ladies. Where ladies attend alone they must be members, and must register and attend as such.

Members are urged to attend this convention both to help those who are working to improve conditions in Nova Scotia and also to promote the general forest protective work of the Association. Incidentally it will enable members to see and learn much of Nova Scotia and the Maritime Provinces.

Those who purpose attending should notify the secretary as early as possible, as this will greatly assist in the work of preparation. They will also be supplied with information regarding programme, accommodation, railway arrangements, etc., as soon as available.

JAMES LAWLER, Secretary,
Canadian Forestry Association.
Journal Bldg., Ottawa.

REORGANIZATION OF A. P. P. A. EFFECTED

(Special to Pulp and Paper Magazine).

Since the initiative taken by the wrapping paper division of the American Paper and Pulp Association in the selection of its secretary and the organizing of a permanent system for taking care of the interests of the wrapping paper manufacturers, the time is not far off when the organization of the parent body will be made known. The names of men prominent and influential in the trade have been mentioned for the positions of secretary of the news and writing divisions and also for that of honorary presisdent.

That the organization will live and prosper is certain. The new arrangement is regarded favorably by most factors in the trade and it is the belief of the majority of influential men that the reorganization will make the work of the Association more effective than heretofore. There has been much speculation as to the secretary of the parent body, but great care has been taken in withholding the name of any choice the executive committee may have in mind. Next issue will in all probability reveal the entire personnel of the new organization.

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Paper Finishing Machinery
Built for Service

Complete Rag Room equipments largely in Evidence in leading mills throughout the United States and Canada.

The Gaara Feltless Wet Machine or Decker saves the pulp that goes to waste in the ordinary decker

Write for full information to—
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Cowansville, P.Q.
Branch Office, Florence, Mass, U.S.A.

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Wood Pulp
of all kinds

Chief Offices: Hamburg, Paris, Stockholm, Gothenburg, Milan.

FELIX SALOMON & CO.
140 Nassau St., New York
SOLE AGENTS FOR UNITED STATES & CANADA

DIEU ET MON DROIT

Timber Concessions in the Province of Quebec

Notice is given by the Government of the Province of Quebec, that, on the 11th of August, and on the 20th of October, 1914, permits to cut timber on over 8,000 square miles of Crown Lands will be offered at public auction.

The territory to be disposed of comprises some 1,200 square miles in the basins of rivers Ottawa, Harricana and Bell, in the Abbitibi region; 6,000 square miles in the Lake St. John northern region; 350 square miles in the Lake St. John East agency; 242 square miles in the Matapedia division.

On the first date above mentioned, permits will be offered at ordinary conditions on some 3,000 square miles.

The timber grants advertized for the 20th of October, comprising the basins of three large rivers in the Lake St. John region, with considerable water powers, will be subject to the obligation of manufacturing the wood into pulp or paper within the province of Quebec.

For particulars, please apply to the Department of Lands and Forests, Quebec, Canada.

ELZ. UIVILLE DECHENE,
Deputy-Minister of Lands & Forests.
Quebec, 11th April, 1914.

TIMBER SALE

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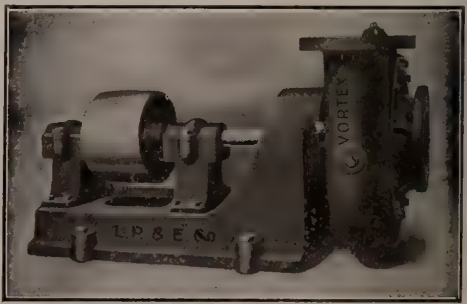

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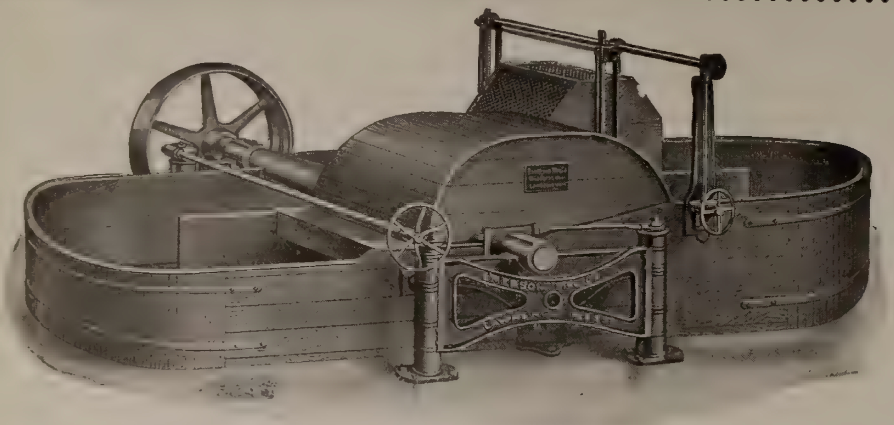

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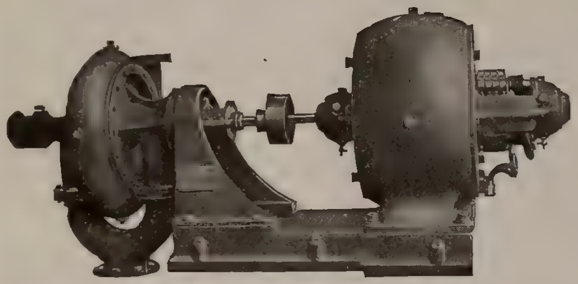

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- Farrell Foundry & Mach. Co., Ansonia, Conn.
- Fullner, H., Warmbrunn, Germany.
- Glens Falls Machine Works, Glens Falls, N.Y.
- Green Bay Barker Co., Green Bay, Wis.
- Hamilton, Wm., Co., Peterboro, Can.
- Harmon Machine Co., Watertown, N.Y.
- Jenckes Machine Co., Sherbrooke, Que.
- Jones, E. D. & Sons Co., Pittsfield, Mass.
- Johnson, C. H. & Sons, Ltd., Montreal, Can.
- Marx, I. & Co. London, E.C., England.
- Moore & White Co., Philadelphia, Pa.
- Process Engineers, Ltd., Montreal, Canada.
- Pusey-Jones Co., Wilmington, Del.
- Rice, Barton & Fales Worcester, Mass.
- Sandy Hill Iron & Brass Works, Hudson Falls, N.Y
- Scott, Ernest & Co., Fall River, Mass.
- Sheldons, Ltd., Galt, Can.
- Sherbrooke Mach. Co., Ltd., Sherbrooke, Can.
- Smith, S. Morgan, Co., York, Pa
- Stebbins Eng. & Mfg. Co., Watertown, N.Y.
- Ticonderoga Machine Works, Ticonderoga, N.Y.
- Valley Iron Works, Appleton, Wis.
- Voith, J. M., New York, N.Y.
- Voith, J. M., Wurtemberg, Germany.
- Walmsley, Chas. & Co., Bury, Eng.
- Waterous Engine Works Co., Ltd., Brantford, Can.
- Westbye, P. P., Peterboro, Can.

Paper Machine Tachomoters
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Schaeffer & Budenberg, Brooklyn, N.Y.

Paper Tester
- Chambers Ltd., 152 Bay Street, Toronto.
- Marshall, T. J. & Co., Stoke Newington, London, England.

Pneumatic Thickeners
- Sherbrooke Mach. Co., Ltd., Sherbrooke Que.

Pneumatic Chain Blocks
- Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Press Rolls
- Bertrams Ltd., Edinburgh, Scotland.
- Chambers Ltd., 152 Bay Street, Toronto.
- Process Engineers Limited, Montreal, Can.
- Sherbroke Mach. Co Ltd, Sherbroke, Que.

Press Wire Cloth.
- Chambers Ltd., 152 Bay Street, Toronto.
- Kufferath, Andreas, Mariaweiler, Germany.

Pulp Stones
- Stancliffe Estates Co., Ltd., Darley Dale, England.

Pumps
- Bertrams Ltd., Edinburgh, Scotland.
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Canadian Allis-Chalmers, Ltd., Toronto, Ont.
- Carthage Machine Co., Carthage, N.Y.
- Chambers Ltd., 152 Bay Street, Toronto.
- Dillon Machine Co., Lawrence, Mass.
- Glen Falls Machine Works, Glens Falls, N.Y.
- Hamilton, Wm., Co., Peterboro, Can.
- Lawrence Machine Co., Lawrence, Mass.
- Lawrence Pump & Engine Co., Lawrence. Mass.
- Smart-Turner Machine Co., Hamilton, Can.
- Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
- Voith, J. M., New York, N.Y.

Rags
- Walker, J. R. & Co., Montreal, Can

Recording Gauges
- Schaeffer & Budenberg, Brooklyn, N.Y.

Recording Thermometers
- Schaeffer & Budenberg, Brooklyn, N.Y

Refiners
- Bertrams Ltd., Edinburgh, Scotland.
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Chambers Ltd., 152 Bay Street, Toronto.
- Marx, J. & Co., London, E.C., England.
- Process Engineers, Ltd., Montreal, Canada.
- Rice, Barton & Falls Mach. & Iron Co., Worcester, Mass
- Voith, J. M., New York, N.Y.
- Waterous Engine Works Co. Ltd., Brantford, Can.

Rope Blocks
- Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Rosin Size
- Fox, Stockell & Co., London, Eng.
- Paper Makers Chemical Co., Easton, Pa.
- Process Engineers, Ltd., Montreal, Canada.
- Vera Chemical Co., North Milwaukee, Wis.
- Wilson-Paterson Co., Board of Trade Bldg, Montreal, Can.

Rosin Size Boilers and Dissolvers
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Process Engineers, Ltd. Montreal, Can.

Rotary Sulphur Furnaces
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Canadian Pulp Mill Machinery Co., Montreal, Can.
- Stebbins Engineering and Manufacturing Co., Watertown, N Y

Runways—Hand operated
- Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Save-Alls
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
- Waterous Engine Works Co., Ltd., Brantford, Can.

Self Landing, Self Delivery Hoists
- Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Screen Plates
- Bertrams Ltd., Edinburgh, Scotland.
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Chambers Ltd., 152 Bay Street, Toronto.

Screens
- Bertrams Ltd., Edinburgh, Scotland.
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Chambers Ltd., 152 Bay Street, Toronto.
- Glens Falls Mach. Wks., Glens Falls, N Y
- Harmon Machine Co., Watertown, N.Y.
- Jenckes Machine Co., Sherbrooke, Que.
- Johnson, Chas., St. Henry, Que.
- Marx & Co., J., London, England.
- Process Engineers, Ltd., Montreal, Canada.
- Sherbrooke Mach. Co. Ltd. Sherbrooke, Que
- Tippet Arthur P. & Co., Montreal, Can.
- Voith, J. M., New York, N.Y.
- Voith, J. M., Wurtemberg, Germany.
- Waterous Engine Works Co. Ltd., Brantford, Can.
- Westbye, P. P., Peterboro, Can.

Shear Legs
- Morris, Herbert, Hoist & Crane Co., Toronto, Ont.

Slings
- Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Slitters and Re-Winders
- Bertrams Ltd., Edinburgh, Scotland.
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Cameron Machine Co., Brooklyn, N.Y.
- Chambers Ltd., 152 Bay Street, Toronto.
- Moore & White Co., Philadelphia, Pa.
- Ticonderoga Machine Works, Ticonderoga, N.Y.

Smelting Furnaces
- Boving & Co., of Canada, Limited, Toronto, Ont.

Straw Cutters'
- Bertrams Ltd., Edinburgh, Scotland
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Chambers Ltd., 152 Bay Street, Toronto.

Straw Dusters
- Bertrams Ltd., Edinburgh, Scotland.
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Chambers Ltd., 152 Bay Street, Toronto.

Straw Digesters
- Boving & Co., of Canada, Limited, Toronto, Ont.

Strawboard Making Machines
- Bertrams Ltd., Edinburgh, Scotland.
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Chambers Ltd., 152 Bay Street, Toronto.

Steam Regulator
- Pickles, W. F., Buckland, Conn.

Stuff Chests
- Boving & Co., of Canada, Limited, Toronto, Ont.

Suction Couch
- Process Engineers Ltd., Montreal, Can.

Sulphite Mill Equipment
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Process Engineers Ltd., Montreal, Can.
- Stebbins Engineeringand Manufacturing Co., Watertown, N.Y

Sulphate Mill Equipment
- Boving & Co., of Canada, Limited. Toronto, Ont.
- Process Engineers Ltd., Montreal, Can.

Sulphur
- Union Sulphur Co., 17 Battery Place, New York, N.Y.

Sulphur Burners
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Glens Falls Machine Works, Glens Falls, N.Y.
- Stebbins Engineering and Manufacturing Co. Watertown, N

Tachometers (Hand and Stationary)
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Schaeffer & Budenberg, Brooklyn, N.Y.

Track Systems
- Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Tanks
- Canadian Allis-Chalmers, Ltd., Toronto, Ont.
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Hamilton, Wm, Co., Peterboro, Can.
- Jenckes Machine Co., Sherbrooke, Que.
- McDougall, John, Caledonian Iron Works, Montreal, Can

Thermometers
- Schaeffer & Budenberg, Brooklyn, N.Y.

Transmission Machinery
- Caldwell, H. W. & Son Co., Chicago, Ill.
- Canadian Allis-Chalmers, Limited, Toronto
- Boving & Co., of Canada, Limited, Toronto
- Jones & Glassco, Montreal, Can.

Traveling Cranes
- Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Trolleys
- Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

MILL SUPPLIES---Continued

Turbines

Boving & Co., of Canada, Toronto, Ont.
Canadian Allis Chalmers, Ltd.. Toronto, Ont.
Smith, S. Morgan Co., York, Pa.
Voith, J. M. Co., Inc. New York, N.Y.
Voith, J. M., Wurtemberg, Germany.

Water Wheels

Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Hamilton, Wm. Co., Ltd., Peterboro, Can.
Smith, S. Morgan Co., York, Pa.
Voith, J. M., New York, N.Y.

Wire Cloth for Paper Machines

Chambers, Ltd., Toronto.
Christie, Geo., Ltd., Glasgow, Scotland,
Johnson, C. H. & Sons, Ltd., St. Henry, Montreal, Que
Kufferath, Andreas, Mariaweiler, Germany.
Tippet, Arthur P. & Co., Montreal, Can.
Taylor, J. A., Montreal, Can.
United Wire Works, Ltd., Edinburgh, Scotland.
Westbye, P. P., Peterboro, Can.

Waste

Hough, R., London, England.

Wet Machines

Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co.. Carthage, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Glens Falls Machine Works, Glens Falls, N.Y.
Hamilton, Wm. Co., Peterboro, Can.
Norwood Engineering Co. of Canada, Ltd., Cowansville. P.Q.
Process Engineers, Ltd., Montreal, Canada.
Sherbrooke Machinery Co., Sherbrooke, Can.
Voith, J. M., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford Ont.

PULP AND PAPER MILL PRODUCTS

This aims to be a complete list of the products of Canadian Pulp and Paper Mills, who are urged to send us lists of brands and watermarks, as well as the headings under which they wish to be indexed. Buyers who cannot meet their requirements from this list, are invited to communicate with the editor, who is in close touch with the mills, and will gladly furnish full information.

PULP MILLS

Ground Wood Pulp

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
Basin Electric Light & Power Co., Ltd., Montmagny, Que.
Beaver Co. Ltd., Thorold, Ont.
Belgo-Canadian Pulp & Paper Co., Shawinigan Falls, Que.
Brompton Pulp & Paper Co., Brompton and E. Angus, Que.
Booth, J. R. Ottawa, Ont.
Bronson Co., Ltd., Ottawa, Ont.
Clyde River Pulp & Paper Co., Ltd., Liverpool, N.S.
Colonial Wood Products Co., Ltd., Thorold, Ont.
Campbell Lumber Co., Weymouth, N.S.
Canada Paper Co., Ltd., Montreal, Que.
Chicoutimi Pulp Co., Chicoutimi, Que.
Compagnie de Pulpe de Dalmas, Dalmas, Que.
Davy, James, Thorold, Ont.
Eddy Co., The E. B., Ltd., Hull, Que.
East Canada Power & Pulp Co., Ltd., Nairn Falls, Que.
Foley-Rieger Pulp & Paper Co., Ltd., Thorold, Ont.
Ford, J. & Co., Port Neuf, Que.
Jacques-Cartier Pulp & Paper Co., Montreal.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
La Cie de Metabetchouan, St. Andre, Que.
La Havre Pulp Co., Ltd., Bridgewater, N.S.
Lake Megantic Pulp Co., Lake Megantic, Que.
Laurentide Co., Ltd., Grand Mere, Que.
MacLaren Co., Ltd., The James, Buckingham, Que.
McLeod Pulp Co., Ltd., Liverpool, N.S.
News Pulp & Paper Co., Ltd., St. Raymond, Que.
Nicolet Falls Pulp & Lumber Co., Nicolet Falls, Que.
North Shore Power, Railway & Navigation Co., Clarke City.
Northumberland Paper & Electric Co., Campbellford, Ont.
Nova Scotia Wood & Pulp Co., Ltd.. Mill Village, N.S.
Ontario Paper Company, Thorold, Ont.
Ouiatchouan Falls Paper Co., Ouiatchouan Falls, Que.
Powell River Co., Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que.
Price-Porritt Pulp & Paper Co., Rimouski, Que.
Reed. A. E. & Co., (Nfld.), Ltd., Bishop's Falls, Nfld.
River-du-Loup Pulp Co., Ltd., Fraserville, Que.
Soucy, F. Florentine, Old Lake Road, Que.
Spanish River Pulp and Paper Mills, Ltd., Espanola, Ont., Sturgeon Falls, Ont., Toronto, Ont., and Sault Ste. Marie, Ont
St. George Pulp and Paper Co., St. George, N.B.
Thorold Pulp Co., Ltd., Thorold, Ont.
Trent River Paper Co., Ltd., Frankford, Ont.
Union Bag & Paper Co., Cape Madeleine, Que.
Trent Valley Paper Mills, Glenmiller, Ont.
Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Q

Kraft

Brompton Pulp & Paper Co., East Angus, Que.
Dryden Timber and Power Co., Dryden, Ont.
New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B
Quebec and St. Maurice Industrial Co., La Tuque, Que.
Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que

Soda Fibre

Canada Paper Co., Ltd., Montreal and Toronto,
Dominion Paper Co., Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.

Sulphite Fibre

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
Booth, J. R., Ottawa, Ont.
Dominion Pulp Co., Ltd., Chatham, N.B.
Edward Partington Pulp & Paper Co., Ltd., St. John, N.B.
Eddy Co., The E. B., Ltd., Hull, Que.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Lake Superior Paper Co., Ltd., Sault Ste. Marie, Ont.
Powell River Co., Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que.
Riordan Pulp & Paper Co., Ltd., Montreal, Que.
Spanish River Pulp and Paper Mills Ltd., Sturgeon Falls, Ont., and Sault Ste. Marie, Ont.
Swanson Bay Forests, Wood, Pulp & Lumber Mills, Ltd., Swanson, Bay, B.C.
Toronto Paper Mfg. Co., Ltd., Cornwall, Ont.

PAPER MILLS

Bag

Eddy, The E. B. Co., Ltd., Hull, P. Q.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
Ford, J. & Co., Port Neuf.
Wilson, Ltd., J. C., 61 St. Alexander Street, Montreal, Que.
Jonquiere Pulp Co., Jonquiere, Que.

Binders' Board

McArthur. Alex. & Co., Montreal.
Northumberland Paper and Electric Co., Campbellford, Ont.

Blotting

Canada Paper Co., Montreal, Que., "Velvet Blotting."

Board

See Wood Board and Cardboard Specials.

Bond

Canada Paper Co., Ltd., Montreal, Que. "Burmese Bond, "St. Lawrence Bond," "Canada Bond," "Burmese Linen Ledger," "Windsor Mills Special," "Silverstream," "Springvale," "Super Writing," "White Railway," "Railway Manilla."
Howard Smith Paper Mills. Ltd., Montreal & Beauharnois, Que.
Kinleith Paper Co., Ltd., St. Catharines, Ont.
Rolland Paper Co., St. Jerome, Que., Mount Rolland, Que. and Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Book and Litho

Canada Paper Co., Ltd., Montreal. Que. "Art Photo Book," "Tinted Art Book," "Art Chromo," "English Book," "Satin Book," "Satin Litho," "Litho Label," "Super S. C. Book," "Standard S. C. Book," "Windsor Book."
Eddy Co., The E. B. ,Ltd., Hull, Que.
Kinleith Paper Co., Ltd., St. Catharines, Ont.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Box Board

See Wood Board and Cardboard Special.

Dominion Timber Regulations

Licenses to cut timber on Dominion Lands in the Provinces of Manitoba, Saskatchewan, and Alberta, the Northwest Territories, within twenty miles on either side of the main line of the Canadian Pacific Railway in the Province of British Columbia, and in the tract of three and one-half million acres to be located by the Government of the Dominion in the Peace River district in the Province of British Columbia, lying east of the Rocky Mountains and adjoining the Province of Alberta, shall be disposed of by public auction at the office of the Dominion Timber Agent for the district in which the berths are situated.

Before any parcel of timber is offered for sale it shall be surveyed by a duly qualified Dominion Land Surveyor into berths of an area not exceeding twenty-five square miles, and each of such berths shall then be thoroughly cruised by a duly qualified timber cruiser in the employ of the Dominion Government. The Minister shall then fix an upset price at which the berth shall be disposed of, and no berth shall be sold at less than the price so fixed.

Purchases to the amount of one thousand dollars or under shall be paid in cash at the time of sale. Purchases over one thousand dollars and not exceeding five thousand dollars shall be paid, one-half in cash at the time of sale, and a note or notes shall be given for the remaining half of the purchase price, payable in three months, with interest at the rate of five per cent. per annum. Purchases over five thousand dollars and not exceeding ten thousand dollars shall be paid one-third in cash at the time of sale, and notes shall be given for the remaining two-thirds of the purchase price, payable in three and six months, with interest at the rate of five per cent. per annum. Purchases exceeding ten thousand dollars shall be paid one-fourth in cash at the time of sale, and notes shall be given for the remaining three-fourths of the purchase price, payable in three, six and nine months, with interest at the rate of five per cent. per annum. Notes shall be made payable at a bank in the city or town in which the sale is held or at a bank in the city of Ottawa. Cash payments must be made at the time of sale in legal tender or by an accepted cheque on a chartered bank, or by a draft issued by a chartered bank, payable to the order of the Deputy Minister of the Interior. If default is made in any payment required by this section the sale shall be forfeited and void.

The purchaser must also pay the cost or the estimated cost of the survey of the berth before a license is issued.

The licensee shall pay an annual ground rent of five dollars per square mile except for lands situated to the west of Yale, in the Province of British Columbia, in which case the yearly ground rent shall be five cents per acre.

The licensee shall pay the following dues on timber cut on his berth:—

Sawn lumber, 50 cents per thousand feet, board measure.

Railway ties, eight feet long, 1½ cents each.

Railway ties, nine feet long, 1¾ cents each.

Shingle bolts, 25 cents per cord.

And 5 per cent. on the sale of all other products of the berth.

Timber Permits

Yearly permits are granted to settlers, mine operators and others on application to the Dominion Timber Agents, from whom further information can be obtained.

W. W. Cory
Deputy Minister.

Department of the Interior, Ottawa,
December 20th, 1912.

PAPER MILLS---Continued

Bristol

Don Valley Paper Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.
Canada Paper Co., Montreal & Toronto, "King Bristol," "Windsor Bristol," "C. P. S. Tinted Bristol," "Canada Bristol."

Building and Sheathing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que.
British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
Eastern Paper Co., Ltd., St. Basile, Que.
Montreal Paper Co., St. Basil, Que.
Northumberland Paper and Electric Co., Ltd., Montreal.
Riordon Pulp and Paper Co., Ltd., Montreal, Que.
Western Paper Mills, Ltd., Vancouver, B.C.
Jonquiere Pulp Co. Ltd., Jonquiere, Que.
Ford, R. & Son, Port Neuf, Que.
Laurentide Co., Ltd., Grand Mere, Que.
McArthur, Alex. & Co., Montreal, Que.
McLeod Pulp Co., Ltd., Liverpool, N.S.
Walker, J. R. & Co., Montreal, Que.

Cardboard Specials

Hinde & Dauche Paper Co., Ltd., Toronto, Ont.
Jonquiere Pulp Co., Jonquiere, Que.
Macleod Pulp Co., Ltd., Liverpool, N.S.
Canada Paper Co., Windsor Mills, Que. "Victor Printers' Blanks," "Superior Translucent Bristol," " C.P.C. Coated Litho," "Superfine Litho Blanks."
Booth, J. R., Ottawa, Ont.
Eddy, E. B. Co., Ltd., Hull, Que.
Laurentide Co. Ltd., Canada Life Building, Montreal, Que.

Carpet Lining

Ford, J. & Co., Port Neuf Station, Què.
Montreal Paper Co., St. Basile, Que.
Northumberland Paper & Electric Co., Ltd., Campbellford. Ont.
Wentworth Paper Mills, West Flamboro, Ont.
Western Paper Mills, Ltd., Vancouver, B.C.

Coated

Ritchie & Ramsay, Toronto, Ont.
Georgetown Coating Mills, Ltd., Georgetown, Ont.
National Paper Co., Valleyfield, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.

Corrugated Paper

Lazier Paper Mills, Ltd., Belleville,
Hinde & Dauche Paper Co., Ltd., Toronto. Ont.

Cover

Canada Paper Co., Ltd., Montreal and Toronto, "Tinted Art Cover," "Derby Cover," "Fibrestoc Cover," "Cashmere Cover," "X Cover," "XX Cover."
Eddy Co., The E. B. Ltd., Hull, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Ritchie & Ramsay, Toronto, Ont.

Envelope

Don Valley Paper Co., Ltd., Toronto.
Kinleith Paper Co., Ltd, St. Catherines, Ont.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Felts

Bird, F. W. & Sons, Hamilton, Ont., and Pont Rouge, Que.
Eastern Paper Co., Ltd., St. Basile, Que
McArthur, A. & Co., Montreal, Que.
Ford, J. & Co., Port Neuf, Que
Ford, R. & Son, Port Neuf Station, Que.
Montreal Paper Co., St. Basile, Que.
Northumberland Paper & Electric Co., Ltd., Campbellford.
Western Paper Mills, Ltd., Vancouver, B.C.

Fibre

Canada Paper Co., Ltd., Montreal and Toronto.
Dominion Paper Co., Montreal, Que.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
McArthur, Alex. & Co., Montreal, Que.
Riordon Pulp and Paper Co., Merritton, Ont.
Strathcona Paper Co., Strathcona, Ont.
Wilson, Ltd., J. C., Montreal, Que.

Flour Sacks

Eddy Co., The E. B., Ltd., Hull, Que.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal.

Glazed

Provincial Paper Mills Co., Ltd., Toronto, Ont.

Hanging

Lincoln Paper Mills Co., Ltd., Merritton, Ont.
McArthur, Alex. & Co., Montreal, Que.
Moira Paper Mills, Belleville, Ont.
Riordon Pulp and Paper Co., Ltd., Montreal, Que.
Strathcona Paper Co., Strathcona, Ont.

Kraft

Brompton Pulp & Paper Co. Ltd., East Angus, Que.
Dominion Paper Co. Ltd., Montreal, Que.
Dryden Timber and Power Co. Ltd., Dryden, Ont.
New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que.

Leather Friction Board

Walker, J. R. & Co., Montreal, Que.

News

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
Belgo-Canadian Pulp and Paper Co., Shawinigan Falls, Que.
Booth, J. R., Ottawa, Ont.
Canada Paper Co., Ltd., Montreal and Toronto, "Canada Brand."
Eddy Co., The E. B., Ltd., Hull, Que.
Ford, Joseph & Co., Port Neuf, Que.
Fort Frances Pulp & Paper Co., Ltd., Fort Frances, Ont.
Jonquiere Pulp Co., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Lake Superior Paper Co., Sault Ste. Marie, Ont.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
McArthur, Alex. & Co., Montreal, Que.
Miller Bros. Co., Ltd., Glenmiller, Oht.
News Pulp & Paper Co., Ltd., St. Raymond, Que.
Powell River Co. Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que.
Riordon Pulp and Paper Co., Ltd., Montreal, Que.
Spanish River Pulp & Paper Mills, Ltd., Toronto, Ont.
Ontario Paper Co., Thorold, Ont.

Roofing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que
Ford, Joseph & Co., Port Neuf, Que.
Ford, Rowland and Son, Port Neuf, Que.
Montreal Paper Co., St. Bazile, Que.
Walker, J. R. & Co., 35 Common, Montreal, Que.
Western Paper Mills, Ltd., Vancouver, B.C.

Straw Board

Ford, J. & Co., Port Neuf, Que.
Lazier Paper Mills, Ltd., Belleville.
Lincoln Paper Mills Co., Ltd., Merritton, Ont
McArthur, A. & Co., Montreal, Que.
Moira Paper Mills, Belleville, Ont.
Northumberland Paper & Electric Co., Campbellford, Ont
Trent River Paper Co., Ltd., Frankford, Ont.
Trent Valley Paper Mills, Glenmiller, Ont.

Tag

Don Valley Paper Co., Ltd., Toronto, Ont.
Eddy, The E. B. Co., Ltd., Hull, Que.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
J. R. Booth, Ottawa, Ont.

Tissue and Toilet

Eddy Co., The E. B., Ltd., Hull, Que.
Garden City Paper Mills, Ltd., St. Catharines, Ont.
Interlake Tissue Mills, Ltd., Merritton, Ont.
Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Que

Wall Board

Beaver Co., Ltd., Beaverdale, Que.
Bishoprick Wallboard Co., Ottawa, Ont.

Wood Board

Beaver Co. Ltd., Thorold, Ont.
Booth, J. R. Ottawa.
Brompton Pulps Paper Co. Ltd., East Angus, Que.
Canada Paper Co., Montreal, Que.
Eddy Co., The E. B., Ltd., Hull, Que.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Northumberland Paper & Electric Co., Campbellford, Ont.
McLeod Pulp Co., Liverpool, N.S.
Western Paper Mills, Ltd., Vancouver, B.C.
Wilson, J. C., Ltd., 61 St. Alexander St., Montreal Que

Wrapping

Booth, J. R., Ottawa, Ont.
Canada Paper Co., Ltd., Montreal and Toronto, "Scotch Fibre," "Invictus Fibre," Hercules Manilla," "St. Fancis Manilla," "Wave Crest Drug."
Dominion Paper Co., Montreal, Que.
Don Valley Paper Co., Ltd., Toronto, Ont.
Eddy Co., The E. B., Ltd., Hull, Que.
Ford, J. & Co., Port Neuf, Que.
Ford, Rowland, Port Neuf, Que.
Gore Valley Paper Mills, Dundas, Ont.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Canada Paper Co., Monreal and Toronto.
See also Kraft.

Writing

Howard Smith Paper Mills Ltd., Beauharnois, Que.
Kinleith Paper Co. St. Catherines, Ont.
Rolland Paper Co., Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Manufacturing Co., Cornwall, Ont.

THE PROVINCE OF ONTARIO

is rich in timber, mineral, agricultural, and other resources.

Ontario has large areas of White Pine and other valuable timbers, her timber products last year representing one-third of the total output of Canada.

Ontario has pulpwood areas practically illimitable, and offers a great field for those desirous of embarking in the pulp and paper-making industry.

Ontario has innumerable waterfalls capable of supplying power for all manufacturing purposes, which are obtainable on reasonable terms, subject to development.

Ontario has large pulp and paper mills in operation at Ottawa, Sturgeon Falls, Spanish River Sault Ste. Marie and Dryden and large plants are under construction at Abitibi on the Temiskaming and Northern Ontario Railway, and Fort Frances on the Rainy River.

Ontario is traversed East and West by three great transcontinental railways, and North and South by three others.

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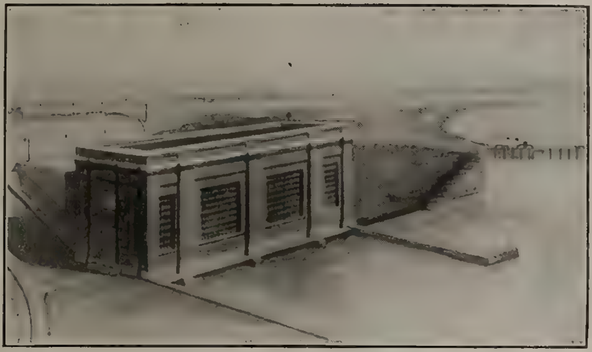

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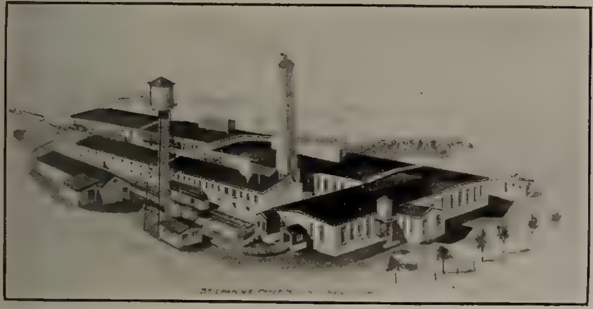

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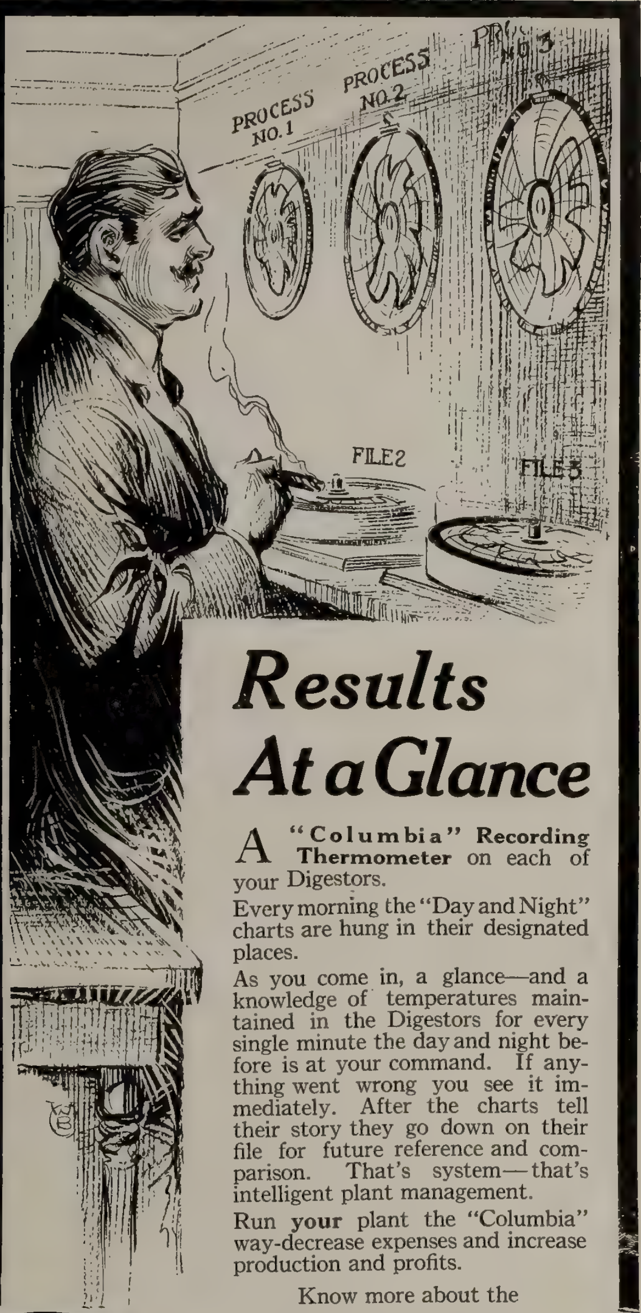

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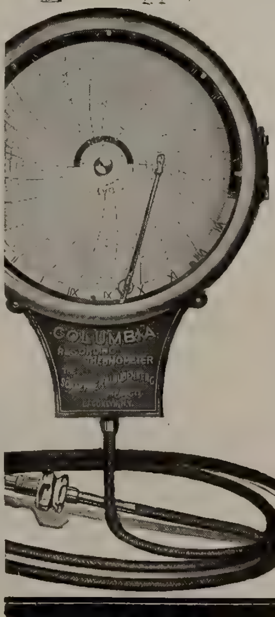

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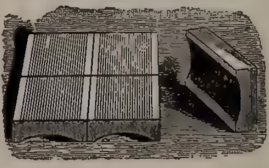

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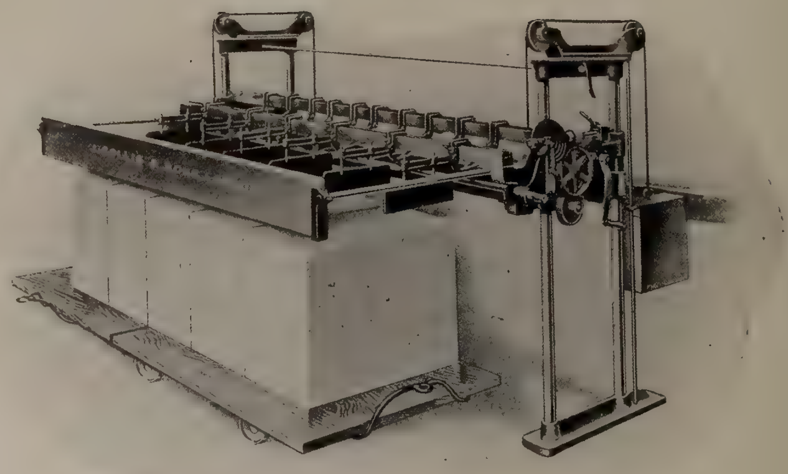

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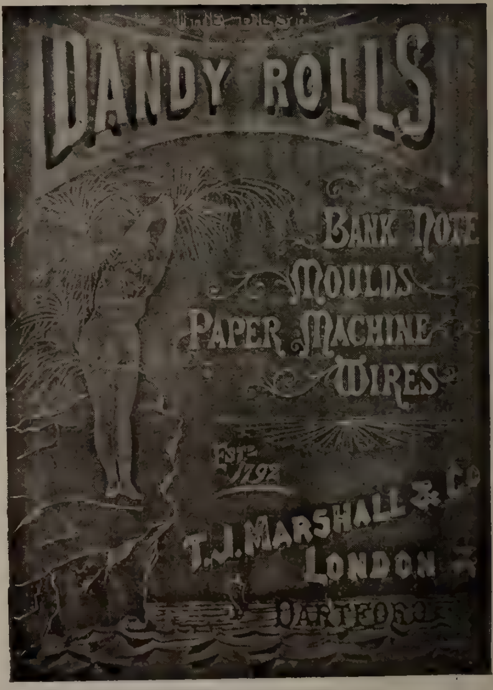

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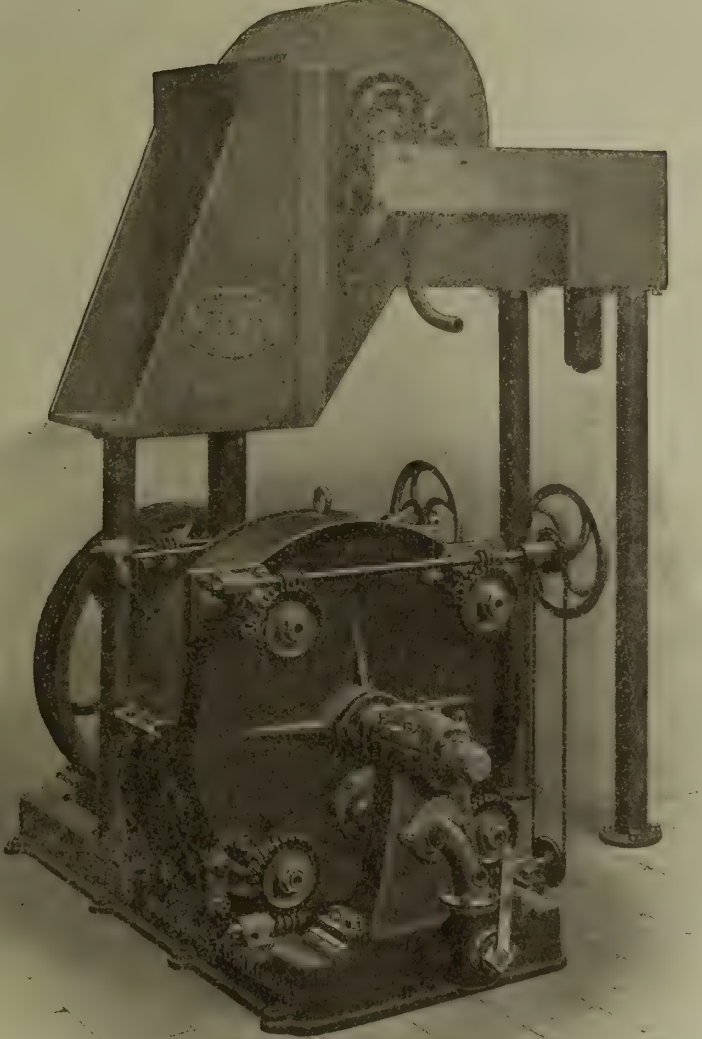

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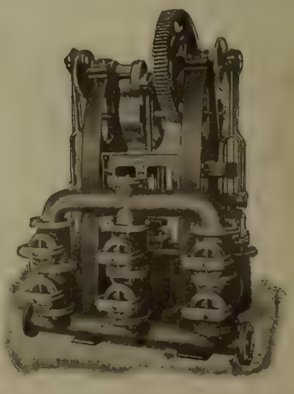

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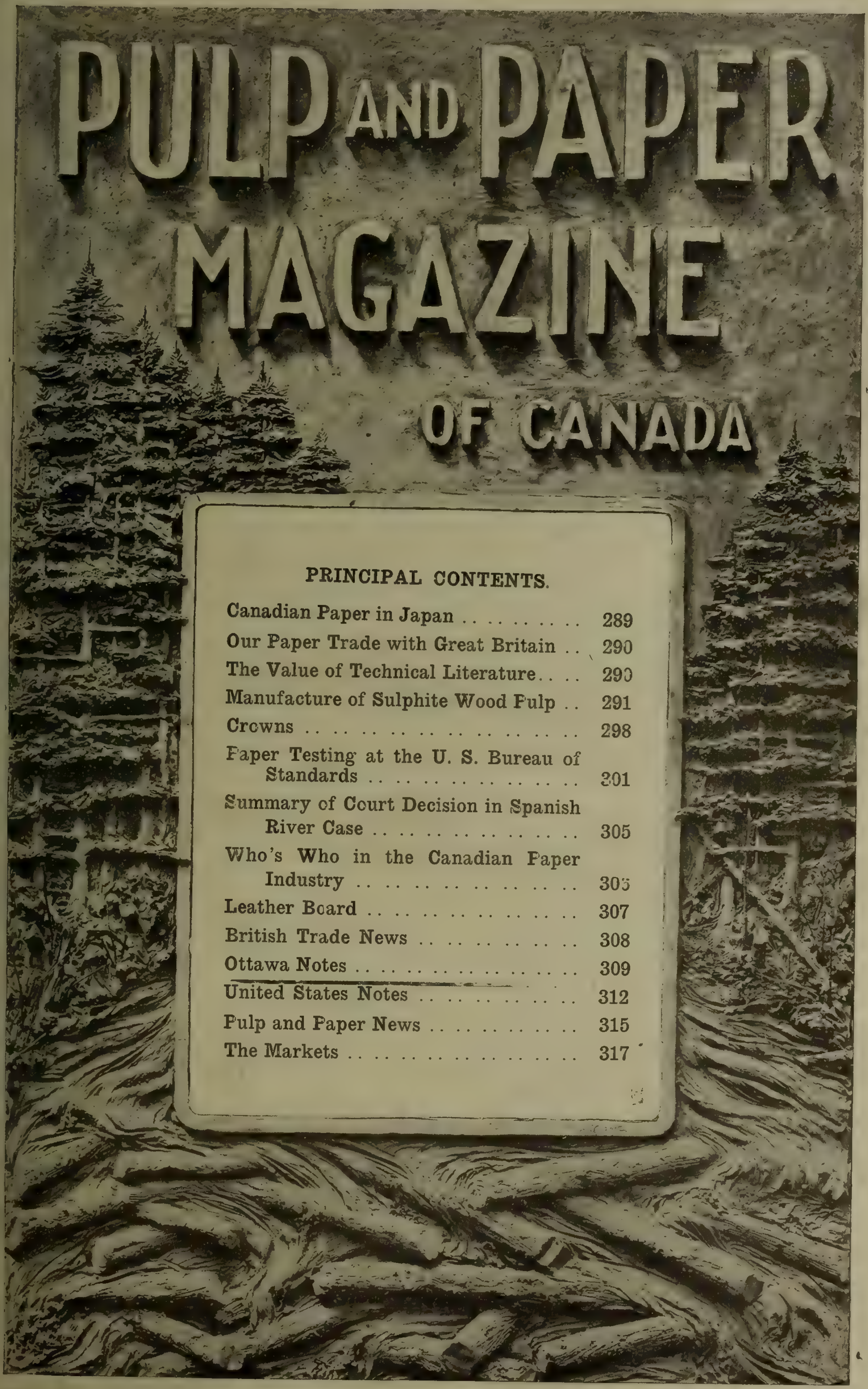

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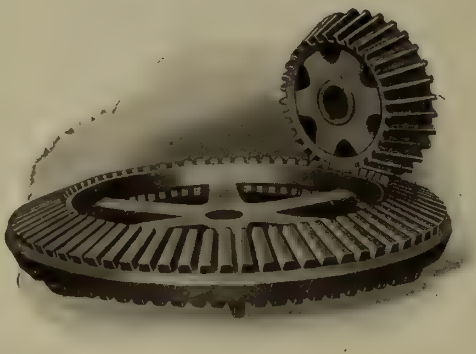

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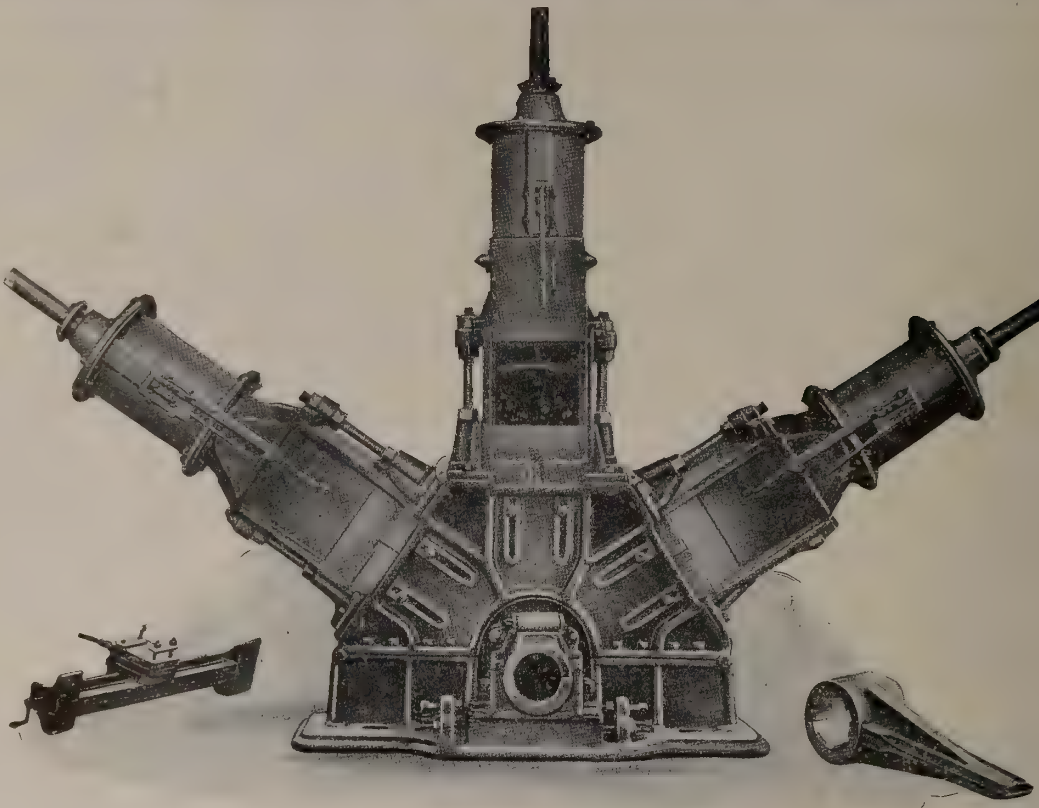

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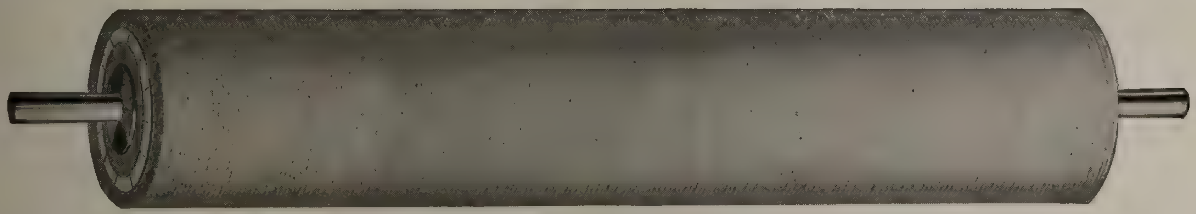

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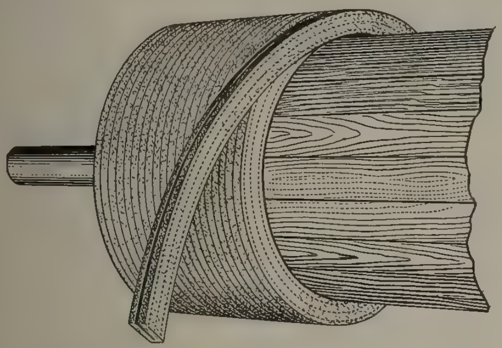

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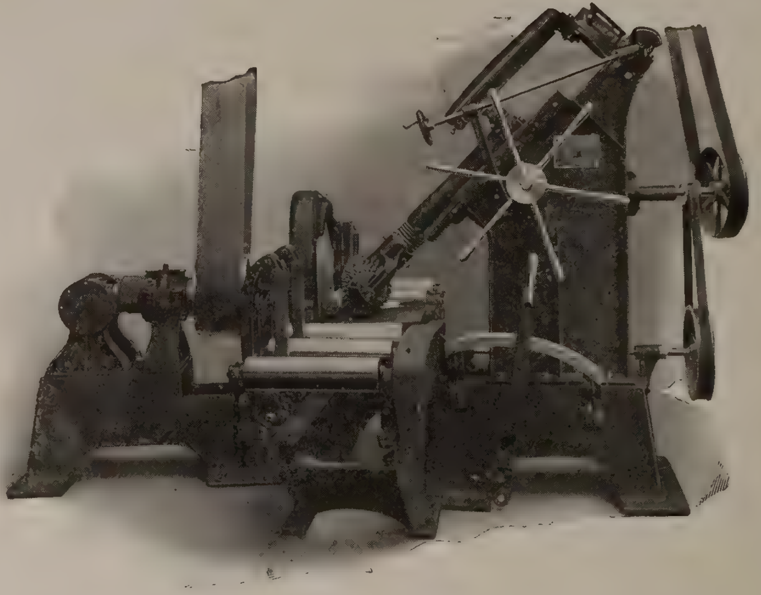

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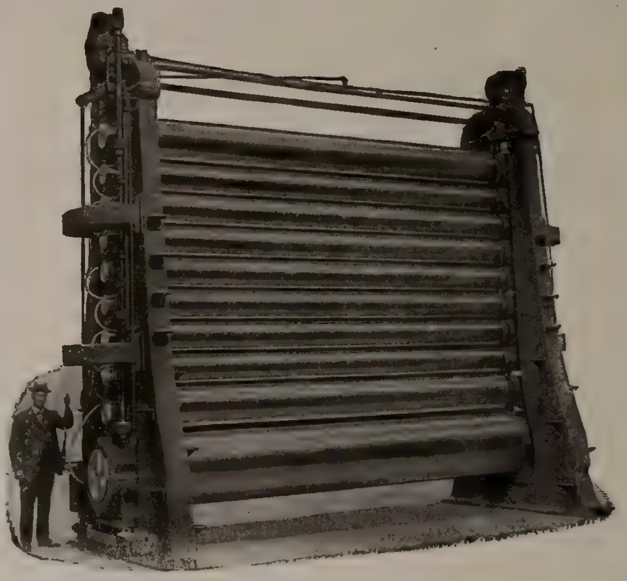

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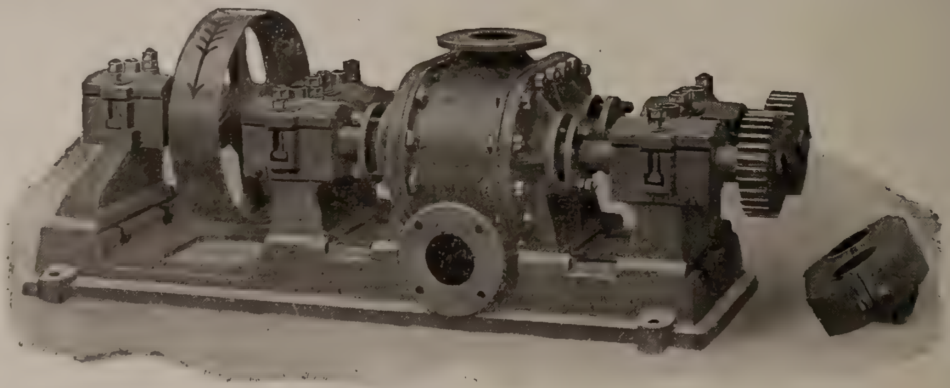

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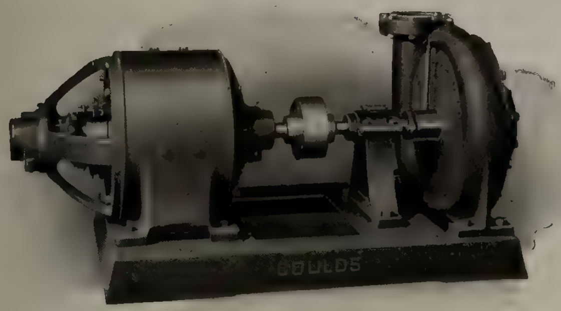

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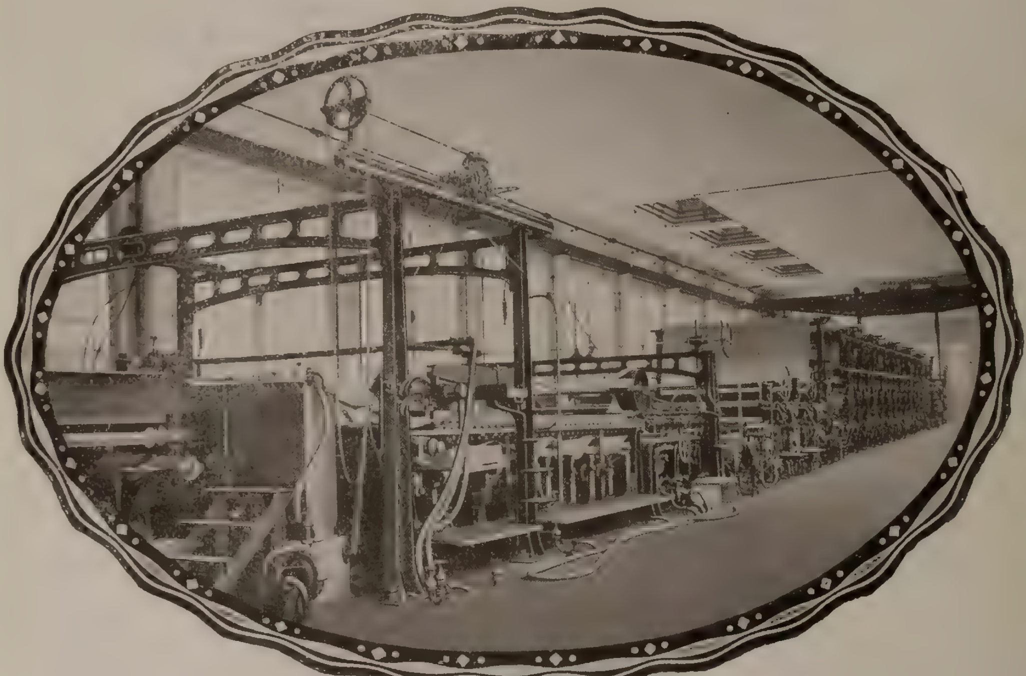

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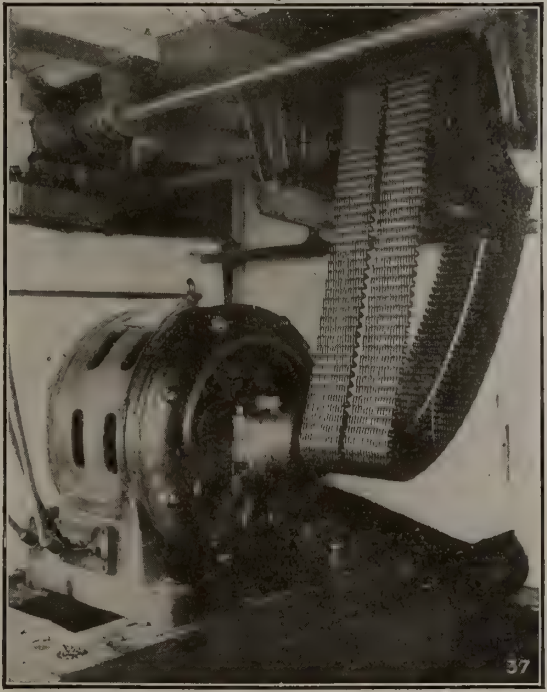

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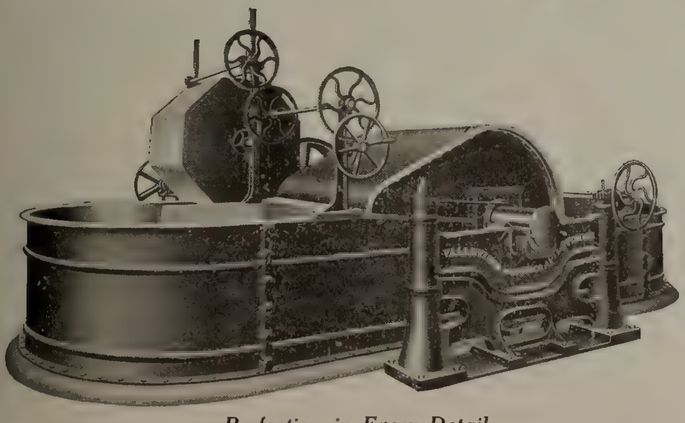

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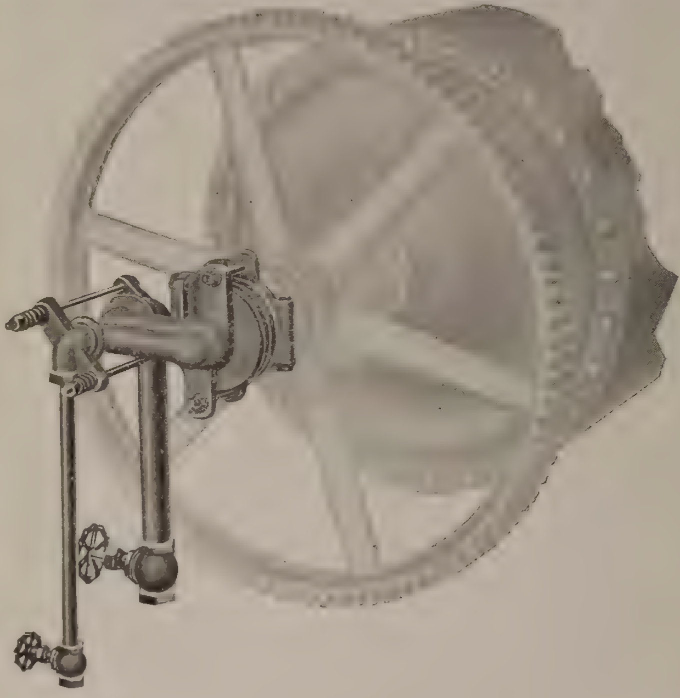

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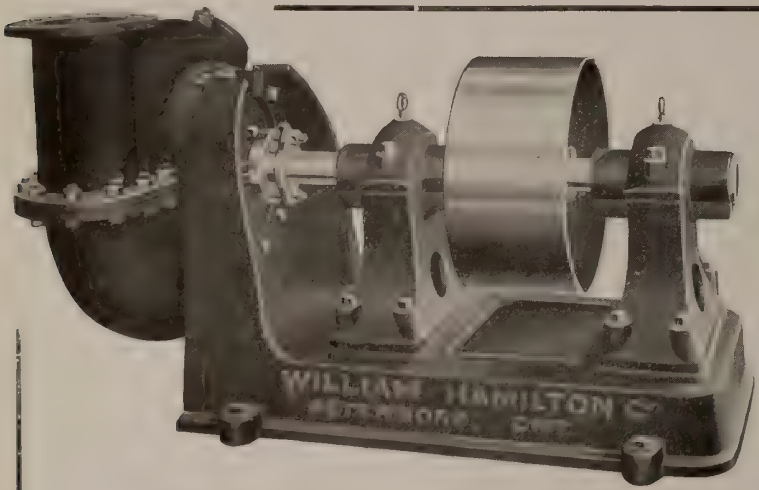

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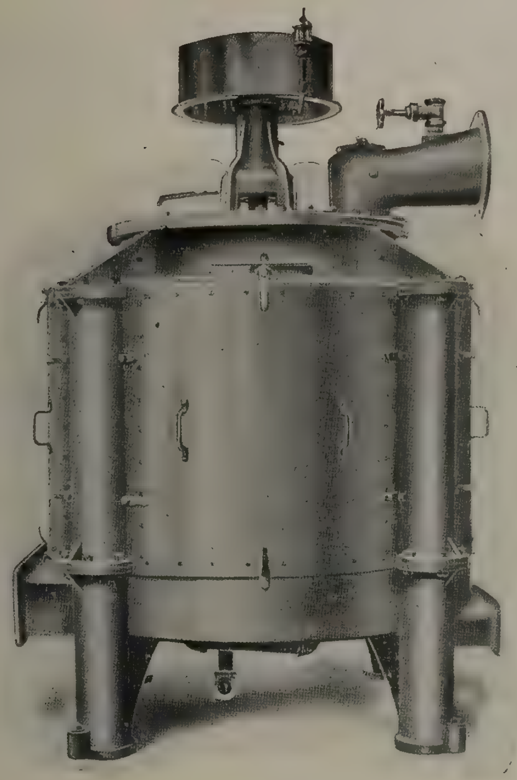

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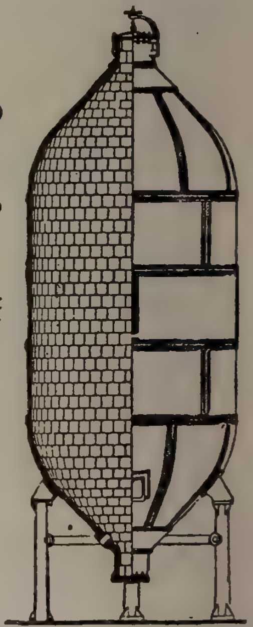

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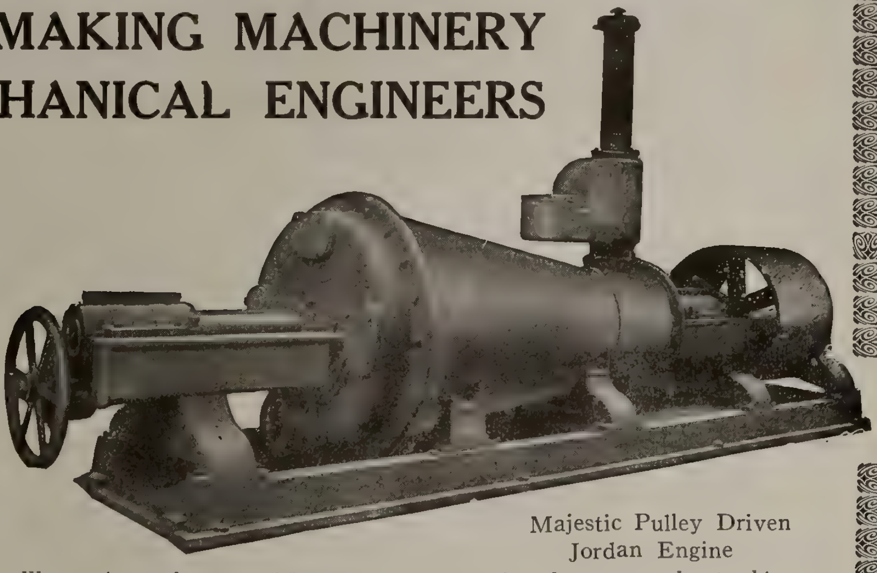

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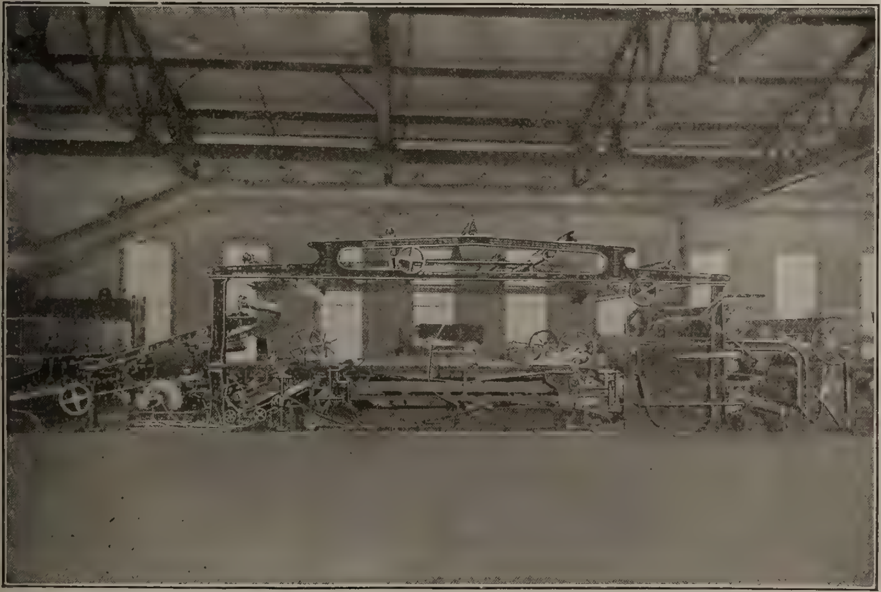

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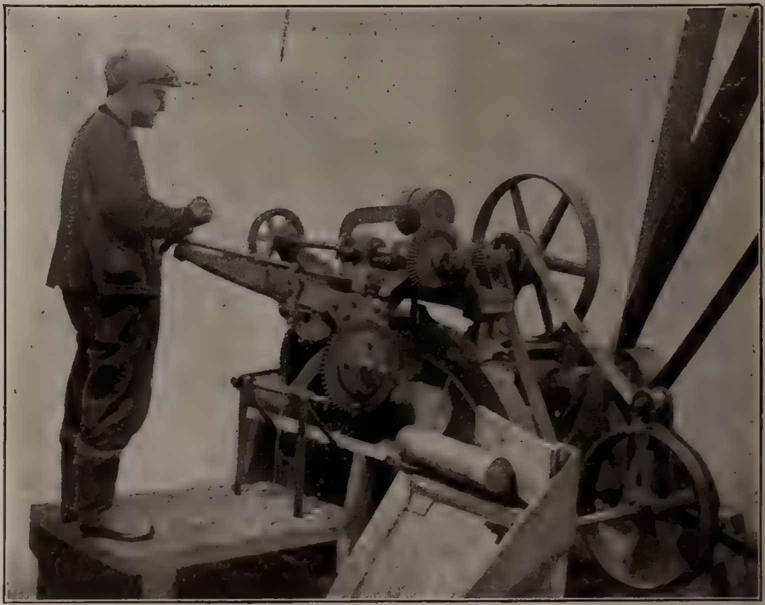

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VOL. XII. MONTREAL, MAY 15, 1914 No. 10

Canadian Paper in Japan

That "Japan is a most promising field for the Canadian producers of pulp and paper," is the statement made in a report to the Trade and Commerce Department this week by Mr. Gordon B. Johnson, special commissioner. The department has recently made an effort to collect information through its trade commissioners, as to the prospects for the Canadian lumber and paper trades in all parts of the world, and a report as to possibilities in Japan was received this week.

Mr. Johnson says: "Japan is a most promising field for Canadian producers of pulp and paper who have up to the present done little to supply this market. While the Japanese policy, as is customary in other countries, is to shut out foreign manufacturers, as far as possible by a high import duty, and allow the raw material or material partly manufactured, to escape free or with a comparatively low duty, nevertheless in the case of printing paper, on which the duty is many times greater than on pulp, the imports are of considerable proportions, as shown by the fact that in 1913 the total value of imports was 3,445,274 yen, or about $1,722,500. The consumption of paper of all kinds is rapidly increasing. This is very marked in the case of printing paper, the Japanese production of which rose steadily from a value of $2,600,000 in 1905 to $6,231,000 in 1911. The imports of printing paper have increased in the same period, amounting in 1905 to $943,000, and in 1911 to $1,198,500, while in 1913 the total was $1,722,500, as stated.

"It will thus be seen that about 27 per cent. of the paper consumed in Japan, printed and other, is imported from Great Britain, Germany, Belgium, the United States, Sweden and Norway. High grade printing paper particularly is in demand from abroad, while on the other hand qualities selling at about 5 cents per pound have about ceased to come into the country, owing to competition offered by the mills here. News print in rolls and packed flat, is manufactured in Hokkaido, and almost entirely supplies the local demand. While production of paper in Japan is rapidly increasing, the consumption is going ahead at a still faster rate, so that increasing imports may be looked for.

"Canada supplied to this country in 1912 pulp to the value of $9,000, and in 1913 the figures were $177,000, a gratifying increase. Imports consist principally of easy bleaching and strong, and, in a lesser degree, bleached. Canadian pulp has not as good a reputation as the European article. With such immense areas in British Columbia covered with Douglas fir suitable for chemical pulp and of Sitka spruce, an excellent pulpwood, and with Ontario, Quebec and the Eastern provinces in possession of almost inexhaustible supplies of spruce and balsam fir, it is a matter of regret that Canada supplies so little of the great and growing demand for pulp in this country, although the figures for 1913 indicate an upward movement. It will be seen that Germany, Norway and Sweden have almost the whole of this trade. While Eastern Canada is handicapped by its great distance by water from the Orient, the opening of the Panama Canal will put Montreal in at least as favorable a condition in regard to distance as those European countries, so that not only British Columbia, but Ontario, Quebec and the East should be in a position to take a share in it. In this connection it may be noted that the statement that a Japanese steamship line is arranging a service from Japanese ports through the Panama Canal to Montreal, has been denied by the head office of the company in Japan. The Japanese Government, however, is providing a subsidy for a new route through the Panama Canal to New York, calling at Seattle.

Our Paper Trade with Great Britain

Some attention has been drawn of late to the possibility of increasing the exports of paper from this country to Great Britain and various opinions have been expressed in this connection, the consensus being that this trade would be very difficult to enlarge until many conditions that at present prevail in the paper industry here are overcome. Some time ago we drew attention to the fact that British paper-makers are exporting paper to the United States and at the same time German paper-makers are placing their newsprint on the British, as well as the United States markets, at a lower price than is possible to manufacture it here. Both the British and German mills have to import their pulp, but they have so reduced manufacturing costs and so utilized the waste that it appears as though it will be some time before Canadian paper will become a factor on the British markets.

The industry in the Old Country is confined almost solely to the manufacture of paper, and on the higher grades the British manufacturers have established an enviable reputation, both as regards quality and price. So much so, in fact, that Canadian paper manufacturers have trouble in competing with the British product on the Canadian market. The big proportion of the raw material is secured from Norway and Northern Russia, where the pulp is manufactured at a minimum of costs. In fact, shipments of Norwegian sulphite pulp have been made, in somewhat large quantities, to this country during the past few years, sufficient to considerably alarm the pulp manufacturers here. Shipments of Canadian pulp to the Old Country have not been large, and those mills that have made an effort to cater to that trade have been compelled to sell their product at a much lower price than is prevailing in the markets here, being able to do this on account of the advantages possessed in the way of limits, power, shipping facilities, etc.

The paper trade between Great Britain and this country has for many years been in favor of the former. Our total exports of paper to Great Britain during the fiscal year ending March 31, 1913, amounted to $1,796,049. During the same period our paper exports to Great Britain amounted to $586,223, of which $202,215 worth was of "paper, costing not more than 2¼ cents per pound."

There is undoubtedly a market in the Old Country for Canadian paper, but not at the prices now prevailing there. The German competition will undoubtedly hurt the British paper manufacturers, but it is not thought that the present situation will exist for long, as the cost of manufacturing has been reduced to a minimum in British mills and the quality of their product is so high that outside competition it not much feared.

The Value of Technical Literature

The series of articles now appearing in the Pulp and Paper Magazine on the "Manufacture of Sulphite Pulp" have been written with the idea of giving the younger generation of pulp and paper makers some concrete information and instruction on this important phase of the paper manufacturing industry in this country. Articles such as these are very valuable, containing as they do, information obtained from years of experience on the part of the writers. The present articles deal with the sulphite pulp processes in all their various detail and give a most exhaustive description of the methods now in use. The writer, Mr. G. B. Steffanson, is one of the best known and best informed men on this subject in Canada. His experience has been gained in various countries and he is therefore thoroughly familiar with his subject. These articles should be of great help to young paper-makers and those anxious to grasp every opportunity to further their knowledge on pulp and paper manufacture.

During the past few weeks a large number of young engineers have obtained their degrees in the universities throughout the country, many of whom are looking to the pulp and paper industry as a possible field. Many of these men have already had some experience in the mills. They are chuck-full of theory and are after the practical application. It is to their advantage to get as much information as possible and one of the best ways of securing that practical knowledge is by studying the technical journals devoted to the pulp and paper industry. There they will find valuable information derived from experiences of authorities throughout the world, which will be of great assistance to them in their work and study.

Manufacturers should encourage this sort of study by providing the proper facilities. Many of their employees require encouragement, even to read the trade and technical journals, and it is undoubtedly advantageous to the running of the plant to have men in charge, or on the machines, who are familiar with difficult processes and methods and therefore able to make practical suggestions. The majority of these articles are not written and compiled with the monetary return as the stimulant. They are written in an effort to spread information, to be of benefit to those who have not had the opportunity of studying the subjects discussed. Trade secrets are rapidly becoming a thing of the past, especially so far as technical knowledge of manufacturing is concerned, and co-operation is becoming more and more the secret of success. It is to the profit of the employers to see that every advantage is taken of these opportunities.

The Weatherhead Paper Co., Ltd., of Toronto, Ont., has taken out an Ontario charter. The capital is $40,000.

MANUFACTURE OF SULPHITE WOOD PULP

By G. B. STEFFANSON.

(Specially written for the Pulp and Paper Magazine).

ARTICLE II.

(Continued from Last Issue.)

It is important to use limestone which is as free from silicious matter and clay as possible, in order to avoid frequent and costly cleaning of the acid plant and handling of much valueless material.

Marble is considered the best stone for all limestone systems.

The high tower system is apparently displacing all other systems in Europe, and even on this continent it seems to be gaining ground. The high towers are more expensive to install than any of the other systems, and the running cost is somewhat higher because the limestone must be hoisted to the top of the tower for charging, but they offer many advantages in other directions. The acid or gas does not come into contact with any pumps or valves before it is ready to be conveyed into the storage tanks, and therefore many costly repairs and renewals are avoided.

The High Tower System.

The system consists of four or more round tanks, 100 to 120 ft. high or even higher, usually 8 to 10 ft. in diameter, made of hard acid-resisting wood. The tanks are slightly tapering upwards, and are lined with acid resisting brick or boards, in order to avoid wear and tear of the tanks by the limestone.

The tanks are joined, and surrounded with a wooden structure, to form a tower, divided into a convenient number of floors, from which the tanks can be entered if this should prove necessary. The different floors are connected with the ground and with the top floor by means of stairs and a limestone hoist, as well as a passenger lift.

A water tank is placed on the top of the tower, which should be sufficient capacity to supply the tower with water for a few hours, in case the water supply should break down. The water in this tank is also used for washing out the tanks periodically, in order to free them from materials which could spoil the draught. This tank is, if possible, supplied with spring water, by means of a pump. This pump, and the hoist and lift, are the only pieces of machinery in connection with the tower.

The high tanks act as smokestacks and no forced draught is required unless pyrite burners are used.

The water is distributed over the limestone in the tanks in suitable quantities by means of sprinklers or other arrangements, so that it is evenly distributed and drips down through the limestone and keeps the surface of this moist.

The limestone in the tanks which should vary in size from pieces the size of a cocoanut to a large cabbage, is supported on stout oak beams about 10 ft. from the bottom of the tanks. A number of beams placed closer together are provided about one foot above the outlet for the acid, in order to catch the smaller pieces of limestone falling through the upper coarser grates and hold them till dissolved.

The water trickles down over the limestone and dissolves the SO_2, which then dissolves the limestone, finally forming the acid bisulphite solution of the composition already mentioned.

The cooled SO_2 is distributed to the different tanks by means of lead pipes fitted with water seals, so that any one of the tanks can be disconnected from the system. The acid overflow a few feet from the bottom of the tanks into a settling tank, and is finally pumped or run by gravity into the storage tanks.

The bottom of the tanks are made to slant towards the mud-holes, which should discharge into a sewer, and at the mud-holes are usually arranged water pipes with sprays, in order to prevent the smell of SO_2 when the sludge is washed out.

This washing out must be done at intervals of from one to four weeks, varying with the purity of the limestone and the design of the tanks, in order to prevent too much sludge from going into the settling and storarge tanks. When this tower system is used, the escape of SO_2 at the top of the tower should be carefully controlled, specially in summer time and when cold spring water is not used; the water supply to the tanks should be adjustable from the bottom of the tower.

Low Towers System Cheaper.

The system of low towers, 35 to 50 ft. high, with 4 or more round or square tanks, connected as described above, is cheaper in first cost but presents many disadvantages. Two tanks are worked together in such a way that the gas rises through the first tower and is passed to the bottom of the second tank through earthenware pipes and finally goes up this tower. In order to obtain the necessary draught the tanks must be closed at the tops and a fan or steam ejector provided on top of the second tank. The weak acid from the second tower is pumped to the first tower. The machinery required for this system is costly to maintain in good order. In these towers the limestone usually rests on beams on the level of each floor of the tower, and the charging done from the different floors. This increases the cost of charging and cleaning considerably. The charging cannot be done every day, but at intervals of one or two weeks, and thus the acid contains too much lime immediately after charging the tanks, and is deficient in lime before charging, unless the mill is so large that several systems of tanks are in use, when this unevenness of the lime in the acid is eliminated. With regard to water supply, gas connections, acid connections, and settling tanks, the low towers are arranged in the same way as the high towers.

Instead of using towers, four or more tanks can be connected in series, as described in connection with the low towers. This system is very expensive in upkeep, and is in use in only a few of the oldest mills in Europe.

The Chamber System.

The cheapest limestone system of all as regards first cost is the chamber system. If the waste gases can be taken to a chimney each system only requires two phosphor bronze pumps. The apparatus consists of two long square chambers which are built together and connected, and each divided into 8 or more compartments, connected alternately at the top and at the bottom. This system is not automatic. In one chamber a certain quantity of water is admitted, and the other chamber contains weak acid. The gas is drawn down through the next one, and then in the same way first through the chamber containing the weak acid so that it passess up through one compartment and through the second chamber, containing the water. Each chamber has a circulating pump, which takes the liquid from the bottom of the chambers through a pipe with branches going into each compartment. The liquid is spread over the whole of the compartment by means of sprinklers, and trickles down through the lime stone, which rests on grates a few feet above the surface of the liquid.

When the acid in the first chamber is strong enough, it is drawn off and water admitted. The gas is then drawn through the system in the opposite direction, i.e., again first through the weak acid and then through the water. The reversing arrangements should only be water sealed, as the necessary suction is only ¾ ins. of water or slightly more. In a few Scandinavian mills, chamber systems with three chambers are used, and some of the mills have made them working continuously, in which case it is necessary to add a gas saver so as not to lose too much gas.

Milk of Lime Systems Most Usual Here.

The milk of lime systems consisting of closed tanks are the most usual on this continent, but they are used in very few mills in Europe. They all work on the principle of drawing the gas through one or more tanks nearly full of liquid, in which the SO_2 is absorbed and the lime dissolved. These tank systems are undoubtedly the cheapest of all acid making apparatus from the point of view of first cost, and are very easy to handle, but show several disadvantages. The cost of burning the lime has already been mentioned. The vacuum required is considerable, amounting to more than the combined height of the liquid in the tanks, and the air pumps are large, and need considerable maintaining in order to work properly. The tanks and connections must be kept perfectly air tight The systems are usually difficult to adjust with regard to the quantity of acid made, except within narrow limits, and interruptions in the run cause large losses.

There are three essentially different types, viz., Burgess', Stebbin's, and Barker's systems. The Burgess apparatus is usually made in the form of one high tank, which is divided into three parts by means of horizontal partitions. The tank is fitted with a stirrer with hollow shaft and arms. The gas passes through the shaft and the perforated hollow arms into the lowest compartment, and then in the same way up to the upper compartments, being intimately mixed with the liquid when the arms of the stirrer pass through it. Stebbin's apparatus consists of two or more tanks usually arranged in steps, and provided with stirrers and two or more partitions in each tank with holes so arranged that the gas, which is drawn in at the bottom must pass from one side of the tank to the other, so as to come into as intimate contact as possible with the liquid in the tanks. Barker's apparatus consists of a high tank provided with three or more horizontal perforated partitions. The gas is drawn in at the bottom and passes up through the liquid and the perforated partitions.

All these systems are provided with overflow pipes for the acid from a higher tank or compartment to a lower one, and the gas pipes are U shaped to prevent acid from being drawn from a higher tank to a lower one through these pipes. Milk of lime is admitted continuously to the top tank, and in such quantities that the acid flowing from the bottom tank is clear, i.e., that all the lime is dissolved. The composition of the acid is regulated by the quantity of lime charged in the milk of lime tank, care should, however, be taken that the milk of lime is not too rich in lime, in which case large quantities of SO_2 will escape through the suction pumps or ejectors if the acid is run clear.

Low towers for milk of lime are in use in only a few mills in Europe. The system consists of three or more towers 25 to 40 ft. high connected in series, and each provided with a covered feed tank with stirrer and pump. Artificial draught, giving a vacuum of 3 to 4 ins. of water is necessary, and is usually created by means of a fan or a steam ejector. The towers are fitted with stones or pieces of wood, so as to provide a large area of contact for the liquid and the gas. The disadvantage of this system is that the tanks become clogged with calcium sulphate, and the cleaning is expensive, and requires much time, as the gypsum sticks to the filling materials.

Several combinations of the above systems are also in use, but it is outside the scope of this article to discuss them.

Important Instructions.

When using milk of lime systems for acid making, it is very important to slake the lime properly. Two methods of slaking are in use. The quick lime is dumped into tanks filled with water provided with agitators, and the liquid is heated to boiling. The milk of lime is then screened before going into the storage tanks. By the other method the lime is slaked in koller gangs or troughs, with the minimum quantity of water, and is then washed into the storage tanks over wire screens and diluted to proper consistency. The second method requires more labour but saves lime and steam. Milk of lime should always be stored in such quantities that it has time to cool down before being admitted into the acid apparatus, as the absorption of SO_2 by the water diminishes very rapidly with increasing temperatures. The storage tanks for milk of lime should always be provided with efficient stirrers.

The acid storage tanks should be so arranged that any leaks can be readily detected. The tanks should also be covered and fitted with gas pipes leading into the acid making system, or to the gas reclaiming plant if more convenient.

The acid storage tanks may be made of concrete, sheet iron, or wood-lined with acid resisting brick, or even common red brick, well pressed and burnt, set in acid proof mortar, and with or without a lead lining behind the bricks. Tanks made of hard pine are cheap, and can be used for many years without lining, they can later be lined with brick and acid proof mortar.

If possible a 24-hours' or more supply of acid should be stored, and the storage tanks should be so arranged that the raw acid coming from the acid making plant, can be blown with SO_2 from the relief and blowing off of the digesters, before it is mixed with the finished cooking acid.

In this connection may be mentioned the cooling of the gas from the digesters, before it is blown into the acid. The cooling of the gas has to be carried far enough to prevent the temperature of the acid from rising to more than 120 deg. F., otherwise calcium sulphite may separate. The gas pipes from the coolers should be arranged in the bottom of the blowing storage tank, so as to produce circulation of the acid, in order to prevent overheating of any part of the acid.

On the other hand the acid should be heated by the gases from the digesters to at least 100 deg. F. in order to save steam.

The gas coolers are either made in the form of lead coils in circular tanks, or an elongated system of pipes of the same diameter as the relief pipes from the digesters, laid in a shallow trough.

Water is preferably and almost exclusively used for the purpose of cooling the gases, only a few old Mitscherlich mills still use the original air cooling in long c. i. pipes.

The raw materials used in acid making should all be tested by a skilled chemist, and any leakage of gas should be carefully guarded against. The escape of any SO_2 from the acid making apparatus should be carefully checked or else great waste may occur.

For an economical running of the plant supervision in other directions is also essential. The burning of the sulphur should be complete combustion, without a large excess of air being admitted. The pyrite burners should always be kept perfectly air tight, except for the proper inlet of air.

The composition of the gas should be ascertained, and the cooking acid should be blown to its correct temperature and composition.

The composition of the waste gases leaving the acid system can be periodically followed by means of Orsat's apparatus, or other apparatus constructed for the purpose. The use of this apparatus need not be described here, it can be learnt from the dealer, or from the chemist. The gas coming from the burners should also be analysed.

Automatic Self-Registers Essential.

It is essential to arrange automatic self-registering instruments in all places where the contents of SO_2 in the gas has to be ascertained. An excess of air in the SO_2 gas causes difficulties, because the moisture in the air admitted, as well as that in the sulphur or pyrites, form steam in the burners, which causes the formation of sulphuric anhydride (SO_3), which in contact with lime forms gypsum ($CaSO_4$). The insoluble gypsum causes deposits and clogging, particularly in limestone systems and this causes considerable loss of sulphur and lime. This trouble seems to have made the limestone systems unpopular when they were first used on this continent. The gas from the burners in plants which are run carelessly, contains frequently only 7 to 8 per cent of SO_2. The contents of SO_2 in the gas should not fall below 12 or 14 per cent for pyrite burners, and can under favorable circumstances amount to 16 or even 18 per cent in gas from sulphur burners. The theoretical amount of about 21 per cent cannot be obtained without sublimation of sulphur, and subsequent clogging of the coolers and waste of sulphur.

Sublimation may occur even with a low per cent of SO_2 in the gas, if the temperature in the burner is too high, and no secondardy air is admitted behind the burners, so as to promote the combustion of the sublimed sulphur in the combustion chamber.

It is of great importance where milk of lime systems are used, to keep the composition of the acid constant, both when it comes from the acid apparatus, and when it has been blown with gas from the digesters. It has in most of these systems proved impossible to make an acid of proper strength without considerable loss of SO_2, and to remedy this, separators have been used to separate condensed steam from the SO_2 gas coming from the digesters, and in this way get the blown acid up to proper strength.

In lime stone systems this is not necessary. The ratio of free and combined SO_2 should here be kept constant, and the acid should be made so strong that after blowing with the cooled gases from the digesters, without previous separation of condensed steam, it should be of proper strength for cooking, or stronger as it is easy to dilute it.

In order to get a uniform pulp, and not waste chemicals, the digesters should always be charged with the same quantity of free and combined SO_2, and not, as is very often practised, charged with a certain quantitl of acid, regardless of its composition.

Green wood needs a somewhat stronger acid than dry wood. Care should be taken, however, that enough acid is charged to prevent burning of the chips in the upper part of the digester, by the steam.

The Analysis of the Acid.

The analysis of the acid is best done by titration with N-10 Iodine Solution and N-10 caustic soda solution. One c.c. of the acid is diluted, starch solution added and titrated with the iodine, until a permanent blue color is obtained. The blue color is then destroyed by means of a few drops of sodium thio-sulphate solution. A few drops of phenolphthalein solution are added, and caustic soda run in until a red colour is obtained. The number of c.c. of iodine solution added indicates the total amount of SO_2 present, and the difference between double the quantity of iodine solution, and the quantity of caustic soda solution used, indicates the amount of combined SO_2.

Multiplying by 0.32 gives the percentage of free and combined SO_2 in the acid. The percentage of lime (CaO) in the acid is to the combined SO_2 as 28 to 32. This test does not give an absolutely correct result, due to the fact that some of the SO_2 evaporates during the test, and to other reasons, but made with care, this test will give a result accurate enough for all practical purposes.

Capacity of Acid Plant.

It is difficult to give absolute figures for the capacity of the different machines and apparatus in an acid plant, but below will be given some approximate figures calculated in tons of pulp per day.

The ordinary retort burner is sufficient for 2½ to 5 tons production.

Rotary burners are built for all productions up to 40 tons. The standard Herreshoffs pyrite burner is sufficient for 12.5 tons.

The capacity of gas coolers has already been mentioned.

Each tank in a high tower system gives acid for 12 to 15 tons, and low towers in series, about the same.

Chamber systems are built for up to 30 tons.

Milk of lime systems are built for all productions up to 100 tons.

Digesters and the Cooking.

There are two different methods of cooking, the heating by indirect steam, and the cooking with direct steam, in some mills these systems are combined.

Mitscherlich (extra strong, as well as bleachable) and ordinary strong pulp, is cooked with indirect heating, sometimes in connection with direct steam; ordinary bleachable and "quick cooked" pulp is invariably cooked with direct steam.

The digesters are of varying size and construction. In old mills there are still in use digesters with a capacity of two tons or even less, lying stationary, as well as rotary supported on rollers or on bearings. The most commonly used digester is, however, the standing stationary type of five to fifteen tons capacity.

The best type of this digester is one with the diameter about one-third of the total length, the lower end consisting of a cone of about 60 deg., ending in a blowout pipe, and the upper end consisting of a cone of about 110 deg., ending in a good sized manhole. This latter design enables the digester to be well filled with chips in a short time, and without too much work.

Digesters are now without exception lined with single or double layers of acid proof bricks set in acid proof mortar, with or without a sheet lead jacket behind. Usually the bricks are three and two inches thick, respectively, in some cases bricks as thin as 1¼ ins. are used, in order to save space, but they are just as expensive as thicker bricks, and do not stand wear and tear as well.

Only non-porous bricks should be used, and they should be set one half inch apart, to make it easy to clean the joints of mortar affected by the acid, and replace it. Well pressed and burnt red bricks are nowadays extensively used for digester lining, but tests should be made, before a new brand of these bricks are used, as bricks apparently not porous may turn out to be porous when used.

Acid proof mortar is usually composed of one part of Portland cement to one or two parts of crushed and sifted acid proof brick, often in combination with litharge and asbestos. In order to get the mortar to harden quickly, it is made with a 4 degree Be. solution of silicate of soda instead of water, and this silicate of soda is during the first cook transformed into an acid proof compound. Care should be taken that no part of the mortar hardens before it is put in position in the lining, as it is liable to break up when applied, and form weak spots in the lining.

Where the digester shells are not absolutely tight, one should line the digester first with a jacket of thin sheet lead, perfectly tight, because the acid is liable to work its way through the mortar to every leak. The lead lining however, has its weak points, as it creeps and buckles from the effect of the difference in temperature and separates the lining from the shell, which must be perfectly smooth inside, in order not to wear the lead out too quickly.

The best way to get **a good reliable lining** is to see that the digester shell is **perfectly** tight, at a hydraulic pressure one and a half times as high as the working pressure. The shell is next lined with a one inch layer of mortar which is not brittle, i.e., acid-proof mortar mixed with a considerable amount of asbestos, or fat lime, or both. On this is laid one layer of 3 inches, or two layers of thinner acid-proof brick.

The joints of the last layer of bricks can be filled in to the depth of about one half inch with a mortar made of litharge and specially prepared glycerine. This mortar resists the acid well but is brittle, and should be examined from time to time and renewed if cracked, in order to prevent the acid from attacking the mortar underneath.

The lining should, at the manholes and pipes, end up against discs or pipes made of hard acid proof metal, cleaned but rough, but should not end up against lead. Where lead lining is used the main body of the shell is covered with about ¼ inch sheet lead with about ½ inch lead at all pipe inlets and manholes.

The Necessary Fittings are two inlet pipes for steam, at or near the bottom of the digester, blow-off valve right at the bottom, or a manhole where the pulp is discharged by gravity, two outlet pipes for gas at the top of the digester, steam pressure gauge, thermometer pocket, and sample cocks. Sometimes digesters are arranged with only one pipe outlet at the top of the digester, combined with an acid proof pipe with valve connections to acid pipe, blow off gas pipes, steam gauge, etc.

By indirect cooking 5 to 8 inlet holes for steam are arranged at or near the middle of the digester, and as many at or near the bottom, each hole provided with a valve and check valve respectively, at inlet and outlet. The inlet and outlet holes are connected inside the digester by means of copper pipes, laid spirally round the digester and supported by acid proof racks.

The blow off valve should be of ample size, not less than 8 inches, connected to an acid proof bend on the bottom of the digester. Where there is water available of a higher pressure than the blow off pressure a water connection should be fitted to this bend, so arranged that the water goes in the same direction as the pulp, but it must be taken into consideration that this cold water gets available rosin to adhere to the fibres, and this scheme should therefore not be used where there is a large percentage of rosin in the wood.

Steam can also be used to quicken the blowing off, and is arranged in the same way as above mentioned, for water. The blow-off valve should be so constructed that it gives as little resistance as possible to the pulp.

The pipes from the digesters to blow pits can be made either of thin copper or c.i. The pitch in the blown off liquor will corrode the c.i. pipes and prevent the SO_2 gas left in the liquor from affecting the pipe. Pipes from acid storage tanks to digesters should be made of copper or hard lead, pipes from digesters to coolers should be made of extra hard lead (3 per cent antimony) or even better of copper, which, however, is more expensive. The fittings on the digesters should be made of best quality phosphor bronze, other acid proof fittings can be made of cheaper materials.

In older mills where scrap metal is available, and where a considerable crew has to be kept for the Sunday repairs, and which crew it is often hard to find work for during the week days, it will pay to make these fittings. All kinds of scrap metal, old brass bearings, valves, etc., are melted in a graphite crucible, and the zinc well "burnt off." To every 6 lbs. of this burnt off metal add 10 lbs. of phosphorous tin and 30 to 35 lbs. of scrap lead. Cast at as low a temperature as possible and stir well in the crucible before and during the casting, preferably with well dried hard wood branches with the bark left intact, in order to get the oxides of the metals to the surface.

This metal resists the acid well, and can be used in casting pumps, valves, etc., but should not be used for digester fittings.

Gas pipes from the digesters to the coolers and acid storage tanks should be 3 to 4 inches in diameter, depending on the size of the digesters. In case screens are arranged inside the digesters to prevent chips and pulp from plugging the gas pipes, these should be made so that no chips can collect on or near them, as these chips will be burnt by the steam during the cooking, and form black specks in the pulp which cannot be bleached.

The cooler should be fitted with pipes of the same diameter as the gas pipes, and made preferably of thin copper, which will make the cooler more effective than if lead pipes are used. The cooler consists as above mentioned of either a high rough tank with a coil of pipes, a shallow round tank with the pipes arranged in a spiral, or a square tank with straight pipes connected at the ends in such a way that the gas has to pass through all the pipes. This latter arrangement is the cheapest in upkeep, and these coolers are easily accessible for repairs, but take a lot of space.

The cooler should be large enough to cool the gas down to about 160 deg. F. in the summer time and the cooling water regulated so as to keep the temperature even all the year round.

The direct steam inlet to the digester should be connected to a coil of lead or copper pipe inside the digester, placed near the bottom and perforated so that the steam is directed up the sides of the digester, thus causing a downgoing current in the middle. In this way a thorough circulation is obtained and the pulp is cooked evenly. It is also necessary to have a small steam inlet right at the bottom of the digester to cook the chips there, and to prevent uncooked chips in the pulp. This steam inlet should also be connected to a small coil provided with perforations.

The Number and Size of Digesters

should to some extent be dependent on the size of the mill. To prevent waste of coal due to a widely varying consumption of steam, the number of digesters should not be less than four, this especially where the sulphite mill has its own independent boiler system.

There are many ways to conduct a cook, differing not only with the quality of the pulp produced, but nearly every sulphite pulp maker has his own ideas of the best way to get a good result. I will here first describe one way to obtain in a first quality easy bleaching pulp.

The steam pressure should be about 75 lbs. time for cooking 11 to 12 hours, and the acid test about 3.7 per cent total SO_2 of which 75 per cent is free and 25 per cent combined. Chips are run in and the cover applied and tightened. Steam is put on from the top of the digester, through the above mentioned pipe with valve connections and is left on until steam comes out through a condensed steam valve at the bottom which has been open all the time the steam has been on, to allow the air and condensed steam in the digester to escape. The steam is then shut off, the condensed steam valve closed, and acid run in without opening the cover. The time required to run the acid in is considerably shortened by the vacuum in the digester, caused by the condensing of the steam. In this case an acid gauge glass at the top of the digester is essential, as well as a small air valve to prevent too large a vacuum. The steam is now turned on from the bottom of the digester. When the pressure in digester, after two or three hours, depending on the size of the digester, is at 75 lbs., the relief valve is opened slightly and the temperature brought up to about 240 deg. F. in the course of an hour. Now the steam and relief valves are both shut for one, or one and a half hours, after which time the steam is turned on and the relief valve slightly opened again. The maximum temperature of about 300 F. should be reached in about 10 hours, with the pressure still about 75 lbs. The steam is now shut off, but the relief valve is kept open, and the pressure should in one or two hours go down to about 50 lbs., when the digester is blown. The liquor should now by test show about 5-100 of 1 per cent of SO_2.

If the cooking is allowed to go on until the liquor by test shows no trace of SO_2, i.e. no bisulphite is left, the cook is more or less "burnt," depending on the length of time it has been going on without bisulphite. The liquor as well as the dry pulp from a "burnt" cook, has a peculiar smell, the pulp is sometimes brown in color, and very soft and spongy. This pulp bleaches very easily, but makes a very soft paper, can never be bleached to a high color, and the yield of pulp is considerably below normal.

A quick way to determine whether there is any bisulphite left in the digester, is to pour a few drops of ammonia into a sample of the liquor. If a precipitate forms there is still bisulphite left, and from the quantity of the quick-settling precipitate, the quantity of bisulphite left in the digester can easily be judged.

It is not absolutely necessary to steam the chips, but this makes them more evenly moistened, and drives most of the air out of the digester, thus helping to make a better quality of pulp.

Care should be taken that the vacuum in the digester does not get too large, either when admitting the acid after steaming or during the blowing, as the vacuum has a detrimental effect on the lining.

To close the steam as well as the relief valve for some time after the digester is boiling, helps to make a finer and more evenly cooked pulp, but also prolongs the cooking process to some extent.

Blowing the Digesters.

Digesters are sometimes blown from full pressure, sometimes from a pressure of only 15 lbs. the best pressure for blowing is, however, from 40 to 60 lbs. If the digester is blown from too high a pressure, some of the uncooked chips and knots will be blown to pieces, and brown slivers will occur in the pulp. On the other hand, if the digester is relieved too low before the cook is blown, the acid in the acid tanks will be too much diluted by condensed steam, as most of the SO_2 gas disappears from the digester at a higher pressure. This has specially to be taken under consideration in mills where a strong raw acid cannot be made.

In case too weak an acid has been charged in the digester or too much gas has been relieved during first part of the process, and a sample of the pulp indicates that the pulp will not be ready by the time all the SO_2 is exhausted, this can to some extent be remedied by closing the relief valve and drawing liquor from the bottom in quantity corresponding to the condensed steam in the digester, in order to give room for fresh steam. Some mills use this method continuously, and relieve from the top, only in the beginning of the cooking process, to get rid of the air in the digester, and at the end of the process to get the pressure down. They must, however, have a separator to separate the liquor from the gas, which latter is sent to a cooler, and the acid tanks. This system saves coal as this outgoing liquor only contains the heat necessary to heat it, whereas in relieving from the top, the latent heat of the steam escapes as well. In this case the acid must be richer in combined SO_2, and the cooking will take more time.

Ordinary Quick Cooked Sulphite Pulp

is most extensively manufactured on this continent, but hardly any European mills make this kind of pulp now, as they have found that it pays them better to make either the higher priced bleachable pulp, or else to make strong pulp which is cheaper in production than the "quick cooked" pulp.

The "Quick Cooked" Pulp

is cooked in much the same way as the bleachable pulp. The steam pressure empolyed varies from 75 to 105 lbs. and the time of cooking from 6 to 10 hours. The chips are usually not steamed, and often acid of as much as 4.8 per cent total SO_2 is employed. The pulp when ready is sometimes blown into the blow pits from full pressure, with a tremendous loss of SO_2.

An economical way of cooking this pulp is as follows. Steam the chips, use 75 to 80 lbs. steam pressure, and acid of about 3.7 per cent SO_2 and about 1 per cent combined SO_2. Relieve carefully during the whole cooking process, shut off the steam about one hour before the pulp is ready, and relieve down to 50 or 60 lbs. pressure and blow the pulp. This process will take 9 to 10 hours and about one hour more from blow off to blow off, repairs included.

For indirect cooking more apparatus must be employed, i.e., the above mentioned copper coils in the digester, with couplings, inlet and outlet arrangements with valves and check valves, a system of steam pipes so arranged that the steam can be sent from coil to coil in succession in any of two or three digesters, and outlet to the feed water heater or other arrangement to utilize the rest of the heat in the condensed steam. Coils in the digesters should preferably be made of electrolytic copper, which is the best conductor for the heat of the steam into the contents of the digester. The fittings should be made of phosphor bronze. The system of steam pipes connecting the digester coils, as well as pipes and the protection mantle in the feed water heater, should be made of copper or phosphor bronze as it sometimes happens that the coils in the digesters break.

Coils and steam pipes are usually made 1½ ins. in diameter. The process of cooking with indirect steam varies considerably with the quality of pulp produced. Steam from 60 to 100 lbs. pressure is employed. The acid varies from 3.5 to 4.5 per cent, total SO_2, of which 20 to 35 per cent is combined SO_2.

In the original Mitscherlich process steam of about 60 lbs. was used, with acid 3.6 per cent, total SO_2, of which about 33 per cent was combined, and the time of cooking was up to 60 hours. Most of the strong sulphite pulp on the market is now, however, cooked in very much shorter time. The bleachable Mitscherlich of the present is very seldom cooked more than 40 hours, and usually not over 24 hours.

The following method can be considered the Standard method of

Cooking "Strong" Pulp.

Steam pressure about 75 lbs. (in which case the digesters should be built for about 90 lbs. working pressure, as the pressure in the digester rises above the pressure of the steam in the coils).

Acid about 3.6 total and 0.9 per cent combined SO_2 should be used. The chips are steamed, and acid run in until it practically fills the digesters. Steam, that has already passed the coils of one or two other digesters, is first turned on the coils, and "live" steam is not applied till the other digesters are finished cooking. When the digester is under pressure, relieve carefully for a few minutes, to get rid of the air in the digester, and repeat this two or three times during the next hour.

Steam pressure is kept on the coils all through the cooking process, which takes from 13 to 16 hours. Care should be taken to watch the cooking during the latter part of the process, as the chips, with the strong acid and high temperature at the end of the cooking, very quickly turn into pulp.

About one hour before the cook is ready, the steam should be shut off the coil and the digester relieved down to about 50 lbs., and blown. Care should be taken that the digester is not relieved too quickly, or else the pulp may not be cooked by the time most of the SO_2 gas is exhausted.

In some mills direct as well as indirect steam are applied at the beginning of the cooking, to get the pressure in the digester up quickly, in order to shorten the time of cooking. The direct steam is, however, usually discontinued when the digester is at a temperature of about 140 deg. F., or even sometimes at 200 deg. F. In this case the digester should not be filled with too much acid. Care must also be taken to make room for the condensed steam from the direct steam. This can be done by drawing some acid from the bottom of the digester, which acid can be sent back to the acid tanks.

A good way to press the acid into the chips before the digester is under steam pressure is to apply hydraulic pressure corresponding to the steam pressure. When the acid is run into the digester with the cover off, the cover should not be applied before the temperature of the digester contents is about 150 deg. F. This will help to remove the larger part of the air from the chips and the digester.

Most cooks judge whether the cook is ready or not, and whether the cooking is going on regularly, by the smell and color of the liquor. Sometimes, however, he will find that the cooking is not going regularly, and does not know or cannot find the reason. Now it is of importance to have arrangements to take a sample of the pulp in the digester, to determine what to do in order to get a proper cook.

Judging Quality of the Pulp.

An even grade of pulp can be obtained by judging the quality of the pulp by dipping a well washed and squeezed sample of pulp in a 4 deg. Be. bleach liquor, sampling from the digester until the pulp shows the desired color when dipped in the bleach. A quick way to determine whether there is any combined SO_2 (Bisulphite) in the liquor is the ammonia test prescribed above. The best way, however, to determine the progress of the cooking is by titrating with N-100 iodine solution.

When cooking strong pulp one way to determine the quality of the pulp is to shake a well washed small sample in a high glass, and judge the quality from the appearance of the fibre.

The pressure as well as the temperature of the digester should always be watched carefully, and if any irregularity occurs the reason be found and remedied, otherwise it is impossible to obtain a good even grade of pulp.

Care should be taken that everything is made as convenient as possible for the men to charge the digester quickly, by providing good sized pipes for acid, reliable acid pump, large manhole at the top of the digester, easily accessible blow-off valve, and other valves, and fittings of a standard type to allow quick exchange of any broken or worn out part, etc.

The time of charging the digester from blow-off to "steam on" varies from one half to one hour, and should never take more time than this, even for the largest digesters.

The output of pulp in a given digester space depends on the kind of pulp made, the way the chips are filled in the digesters, and the size and quality of the chips.

Mitscherlich and ordinary strong pulp requires 400 to 425, "Quick-cooked" pulp about 450, and easy bleaching pulp 475 to 500 cub. ft. digester space per short ton air dry pulp.

Blow Pits.

The blow pits should be built so low down that the blow pipes from the digesters are horizontal. The blow pipes should enter near the top of the blow pits. Pits are usually square or round covered tanks, made of hard wood or of well pressed red bricks in cement mortar, and with a cover of hard wood. Concrete tanks are not to be recommended, as the hot liquor affects the concrete. Woods such as hard pine, southern pine, and even white pine, resist the action of the liquor for years.

The bottom of the pit should be inclined towards a hole in the bottom, where the outlet for liquor ends in a quick opening flange or gate valve, above the sewer system. A false bottom is arranged from 12 to 15 ins. above the bottom, made of hard wood planks (pine) standing on edge, but so arranged that the liquor can freely run underneath to the outlet. Perforated drainage tiles are supported by these planks and in laying of the tiles, one inch dry laths should be laid between each row. When these laths swell by the contact with the hot liquor, the tiles will be held securely in place.

Above the false bottom is arranged an outlet to a pulp pump or agitator chest. The false bottom should preferably be inclined towards this pipe.

An ample outlet for the steam from the pit should be provided. This should be placed where the pulp cannot escape with the steam, and should be made of pine, and may conveniently be carried over the roof of the digester room. Where square blow pits are used, and placed together, i.e., built in one structure, two or four pits are connected to one steam escape, but care should then be taken that this is so dimensioned that steam does not go into the other pits when the dampers are closed.

In case each digester has its separate pit, this should be large enough to hold at least two cooks, and the digesters should never be charged before there is ample room in the pit, otherwise a break down in the wet end of the mill might also cause the loss of a cook by "burning" it.

When the cook is blown, the flange at the liquor outlet pipe is opened, and the liquor is let out of the pit. Water preferably hot, is then admitted from the top of the pit, and in such quantities that the water level is over the pulp, this in order to get the pulp takes from 4 to 6 hours with cold water, the water is thoroughly washed. When the pulp is washed, which shut off and the pulp drained. Now the liquor outlet flange is closed, water is again admitted from the top to nearly fill the blow pit, and a hose of ample size and good water pressure is used, first to loosen the pulp round the pulp outlet pipe, and later during the emptying of the pit, to force the pulp to the outlet. The pulp outlet pipe should be provided with a gate valve, to make it possible to repair pipes and pumps during the washing of the pulp. To prevent stones and other heavy articles getting sucked into the pump and breaking the rotor, a trap should be arranged.

(To be continued).

POINTS WORTH KNOWING.

1—The conveyance of the finished pulp from the edge-runners is economical not only with trucks, belts and elevators. The pulp can also be emptied into a mixing-chest and after being diluted with water conveyed through pipes.

2—Bad mechanical wood-pulp made from decayed timber or fibres beaten dead can never yield a paper of good bulk. Neither special beating nor tending of the machine can obviate this defect.

3—For Chinese coated papers the selection of the mechanical wood-pulp is by no means a matter of no importance. A high-class pulp made with high-power grinders is absolutely necessary.

4—Absorbing papers may not have the greatest possible absorbability in all cases, because many papers are recently being printed on both sides instead of being painted.

5—The color tone for printing papers is by no means not always reckoned for daylight. A complaint with regard to this was due to the newspaper in question being mostly read in the evening.

6—Opaque tissue paper need not always consist of 100 per cent rags. Papers made from pure chemical pulp likewise have a rag-like character when cold bleached soda-cellulose and a few percent of white paper shavings are added.

7—Ordinary newspaper does not always need to be liberated from printer's ink in order to be able to use it again. For toilet paper up to 10 per cent, and for rotary running up to 40 per cent waste newspaper sent through the edge-runners were employed with an admixture of talc and with specially careful tinting with indanthreublen GGS and auranin.

8—Imitation parchment can be made perfectly ink-proof and grease-proof without any sizing. Owing to the omission of the size the fouling of the wires and felts and adherence to the press-rolls is diminished.

9—Papers contining mechanical wood-pulp are not always made in the beater. Frequently all the mechanical wood-pulp passes only through the edge-runners and, with the chemical pulp, through a mixing-beater and a pulp mill.

10—Grey wrapping papers are not always dyed most economically with green vitriol, potash blue or aniline. Black graphite forms an excellently cheap pigment which requires to be only tinted with aniline dye. Likewise grey tobacco papers are advantageously dyed with graphite instead of with the expensive and troublesome lamp-black or aniline dye which is not fast enough to light.—Der Papier Fabrikant.

CROWNS

"Uneasy lies the 'roll' that wears a crown."

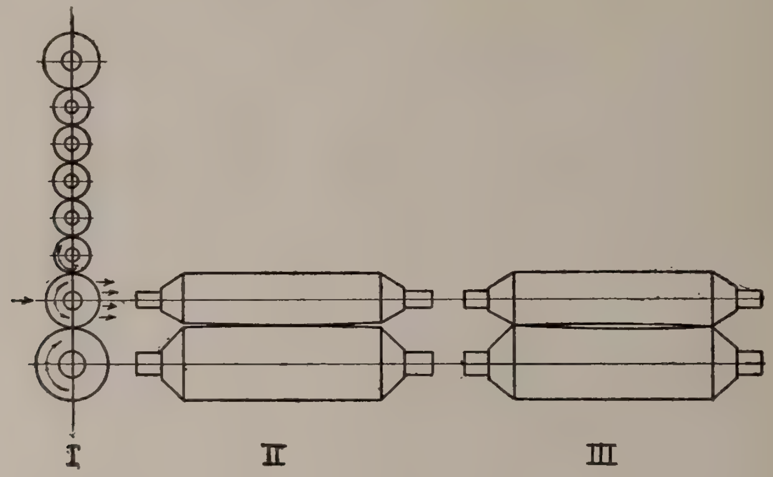
By JOHN W. BRASSINGTON.

(Specially written for the Pulp & Paper Magazine).

A Crown is the emblem of the divinity that does hedge a king; when our ancestors in the German forests uplifted on their shields, he who was greatest in the field of battle, they acclaimed him Konning, he knows—the King. To distinguish such a mortal from the common herd, he was crowned. Analysing the psychological aspect of this proceeding, we recognize that these ancient peoples elected to themselves a King and a Crown, because they were not able to move, as a unit for any given purpose, without a leader; lacking something essential in themselves, they tried to supplement their inefficiency with an addition that was redundant; such a proceeding was excusable in those mentally crepusculous times, but it seems a mean measure of our mechanical ability in this 20th century that we have to give a crown to our Paper Machine Rolls, because of something essential lacking in all that are made.

Before we get our Cyanometer into play, however, let us discuss why we, in this heyday of mechanics, have to do a wrong thing in order to correct an error already committed.

DEFLECTION OF CALENDER ROLLS



It is an exceptionally good Fourdrinier wire that is not a little short in the centre, because it is made on rolls that deflect under the strain of the process of working; it is not always that these rolls are corrected for this deflection by crowning, for this reason it is good practice to make the Breast Roll practically straight faced, so it will deflect the same amount as the wire is short in the middle.

When, however, we consider the Couch Roll, we have a complication of strains; one due to the pull of the wire, this pull being greater at this, the driving point, than at any other; and one due to the pressure exerted by the top Couch Roll, and such weights as may be placed thereon, and another due to its own weight; the resulting stress is approximately at an angle of 30 degrees to a vertical line drawn through the centre of the bottom couch roll, and meeting it at that centre. The necessary corrective crown here is made as small as possible by constructing the lower couch as per as stiff a design as possible. There is a great big difference between designing for stiffness and rigidity, and designing for strength only. A good springy board is often strong enough to bear a body over a ditch ,for instance, yet it may be the reverse of rigid or stiff. The upper Couch Roll Jacket is soft and yielding enough to compensate for any difference in pressure due to inaccurate corrective crowning.

When we consider the Press Rolls, we find that this is one of the crucial points of difference between one machine and another; the deflection of the lower Press Roll is controlled by first its own strength, due to design; second, by the amount of pressure per lineal inch of face, due to th weight of the upper roll and the weights and levers on the journals; and third, by the density of the ribber covering. If the reader will examine a pair of press rolls in operation, he will notice that the surface contact is about one inch wide for a pressure of about fifty pounds per inch of face for a rubber giving a Plastometer reading of 1.K., 125.40; a roll of the right parabolic design owuld require a crown twenty-four per cent. greater than its calculated deflection for the given load; this being true for all widths of machine. Unfortunately, the pressure per lineal inch of face is under the control of the machine tender who, fine fellow as he is, often works by instinct instead of by law. This working by instinct is a fine thing in many ways, for instance, if you sit on a hot stove, you will rise instinctively, but it were nevertheless, better you had not sat down.

It is the necessity of correcting by crown, in part, by softness of covering, and by the use of weights and levers for what is after all an inherent error in design and construction, that has turned the thoughts of the designer towards the possibility of obviating the reason for crowning, by building a Non-deflectible Roll. The writer has been very enthusiastic lately in the study of a design of roll that seems to fill the bill by maintaining under varying conditions of load, a straight non-deflecting face; transferring all variations due to differences in load to the inner shaft by an ingenious method of uniformly supporting the load all over the outer shell, and concntrating the reacting stresses on the interior shaft; the writer followed up the design, manufacture and a severe test of one of these rolls, and the results obtained were in every respect clean cut and satisfactory; there is probably no reason why the paper maker should not order and obtain non-deflectible rolls for his paper machines, in the near future.

When we consider what an advantage such non-deflectible rolls, if successful, would give to the paper maker using them, we also begin to realize what a splendid work he has done in the past in spite of the handicaps under which the paper machine labored. If it is possible, as the writer believes, for the machine builder to furnish reliable non-deflectible rolls for the paper machine, then it will soon be every day practice to furnish definite weights and positions on the levers for those weights, for every grade and kind of paper the machine may be designed to make. Th rolls would not have to be crowned, nor would they have to be reground for a different weight of paper; the weights could be permanently locked in place in such a manner as to put it out of the power of the machine tender to tamper with them.

The length of life of the clothing would, under these conditions, be considerably greater; let us thing for a minute of the inevitable effect of the crowning of say the press rolls on the felts; the centre of the felt must be constrained to travel faster continually, and this tendency must result in stretching the threads of the felt until the interstices assume a diamond shape instead of a rectangular parallelogrammic contour this means a closure of the pores and a decided shortening of the time between necessary washings. The stretching of the centre of the felt also causes this portion, all other influences being equal, to wear away much faster, owing to the action of the whipper and the faster clogging of the pores as above described.

The following description of a Smoothing Roll testing operation in the shops of a prominent firm of Paper Machine Builders, gives a fair idea of the constant care and anxiety this question of crowning rolls for the work required of them, gives to the makers of them:—

Here we are! The housings are in place on the surface plate, and the brass or lower roll is resting its journals in their bearings. Smooth, in "dynamic" as well as static balance, this polished brass roll is constrained from turning by a clamp and lever, so it is ready for its first or deflective test. A micrometer is placed on the surface plate, and a reading is taken of the distance between it, and the bottom of the brass roll at every foot of face of the roll, as well as at the two ends and at the middle; our Engineer shows us his once blank test record already filled in the first column with the readings we had watched being taken. Then here comes another man with the micrometer calipers, so that a record of the horizontal diameters of this much measured brass roll may be obtained and added to the figures already in place. This finished, four husky hustlers begin loading bags of sand onto the top of the roll, 100 pounds each bag, 28 of them; when these are all in place, the readings of the distance between the surface plate and the roll are again taken, as are also the horizontal diameter records, all being duly entered in the places provided for them.

"Deflection nine one thousandths," says our guide.

"Pretty stiff roll; thought it would go eleven," returns the Foreman of the Roll Shop.

"Soleroscope reading fairly high, probably accounts for it," remarks our guide, "only varied one point all along the face."

Now off come the bags to be piled away till the next roll comes in to be tested; all successful paper machine builders should test for static, for running balance, for deflection and crown, every roll that goes on a Paper Machine.

Now the big crane picks up the roller roll, and before placing it on top of the brass roll, it is tested for crown and for rubber density every foot of face with calipers, and with the Plastometer; finally the lower surface of it is covered with chalk and it is lowered into its bearings. Two men come forward, one to each housing, and the ratchets move carefully in unison until the two rolls touch, the levers being detached, so, therefore, there is no weight on the upper roll journals. Then follow more micrometer readings and caliper measurments of both rolls before the rubber roll is raised again to measure the varying breadth of the chalk line marked on the brass roll by the caress of the rubber.

"Crown a trifle small," says a roll expert, and the Engineer nods as he enters another long series of figures onto the test sheet.

The chalk mark is then wiped off the brass roll and more chalk put on the rubber roll; the upper roll is then again lowered onto its mate as carefully as before, so that one end does not touch before the other; but now the levers are hooked up and the weights are placed exactly half way on the levers at each housing. The same series of measurements are taken; the chalk line is a broad parallel mark from end to end of the brass roll.

"Crown is O. K.", says the Engineer.

"Not enough," says a roll expert, "she will show light in the middle when you move your weights out."

"Well, these people only make forty pound paper, and they ought not to overweight that grade of rubber for that weight of paper."

"Oh! pshaw; when the right man comes on, he'll move those weights anyhow, whether they need it or not."

"Well," says the Engineer, "Let us be right as far as we go."

Then again the top roll is lifted and the whole process again repeated with the weights at the extremities of the levers. Finally, the rolls, the weights, the levers and the housings are marked so each will be rightly placed in the field to suit the crown, the density of the rubber, and the work the smoothing press is designed for. The weights and levers being painted red or white, show unmistakeably the proper position.

"That pulley is to carry the wad past and outside the nip of the roll," explains our guide; "you see the paper is reversed at the third press, and the wire marks are underneath."

"The paper is passed over the top rubber roll and is guided by the passage of the wad on the pulley and belt into the nip where the even pressure gives a smooth finish or a finer surface."

"How do we know what crown, what density of rubber to use, and what weights for certain papers? By a great deal of experience seasoned with a fair modicum of theory. We can figure the deflection of any given roll, we can accurately measure the elasticity of the rubber, and we know the pressure per inch of face that will give good results; by combining all these pieces of information together, we are enabled to build a successful smoothing press. These tests are made to verify our work, which is done according to calculations. It is like anything else, you have to know how! After that success is certain reward of eternal vigilance.''

''How many have we built? Between thirty and forty in the last few months; it's like this, if you can build anything better than anyone else, you'll find that Emerson's remark about the work making a beaten track to your door is pretty nearly right, provided you have a good Sales Department.''

The crowning of calender rolls is a problem presenting factors of unexpected difficulty; at first sight it appears evident that all we have to take into account is the load on the lower roll. To correct for the effect of this, all that apparently should be necessary would be to give enough crown to overcome the deflection due to this load. The load on the bottom calender roll, due to the weight of the rolls, only may be 75 tons, on a modern high speed news machine, and this is quite an item to take care of in itself. There is, however, another factor of even more importance, which is possibly better illustrated by a description and sketch of an actual case, in order to point the moral of explanation, than could be shown in any other way.

The three views in the illustration show—

(1) The side diagram, indicating the strains and deflections set up when running;

(2) The appearance of the two bottom rolls of the stack when set up complete, but not running. This view is exaggerated in order to show that the crowning is apparently excessive, the rolls bearing hard in the middle and not touching at the ends, in fact, light could be seen at the ends between the bottom and the so-called lower intermediate roll. These rolls were 160 inch face, and should have apparently, owing to the high pressure in the middle, given ''soft'' rolls on the winder or reel in the middle;

(3) This view shows in exaggerated form the apparent relationship of these two lower rolls when in operation; the rolls of paper made, as received from this stack of calenders, were hard in the middle and soft at the ends, showing beyond a doubt that the crowning was not sufficient.

A glance at view (1) explains the cause of the apparently anomalous fact, showing as it does, that the weight and the movement of the calender rolls, both tend to squeeze out the lower intermediate roll towards the reeel, in the middle where the diameter is greatest; this action is evidently enough to make it imperative to consider these new applications of force to the problem of crowning, when the crown is being calculated.

In conclusion, it is well to note that in no place in the paper machine, would the use of a successful design of a non-deflectible roll give better and more worthy service than in the stack of calenders, unless, indeed, it were in the winder itself.

A report of the New Brunswick Government says that the revenue from the lands annually is $795,750. According to agreement, mileage dues and stumpage fees are to be paid by the operators annually, and timber must be cut under such regulations as will prevent the cutting down of small trees and saplings. In view of the rapid increase in the value of the leases the Government has decided to make a complete survey of its timber wealth.

SALE OF OCEAN FALLS CO. PLANT CONFIRMED.

The contract entered into between the Western Canada Trust Company, as receiver for the debenture holders of the Ocean Falls Company, and Messrs. Fleishacker Brothers and Johnston, of San Francisco, whereby the plant of the Ocean Falls Company, situated 200 miles north of Vancouver, is to pass under the control of a merger of Pacific coast pulp and paper interests, has been confirmed by Justice Morrison of the Supreme Court.

The contract has been unanimously endorsed by shareholders at a meeting called in London, Eng., and provides that the creditors shall be paid by the interests which the taking over the plant and assuming the liability toward debenture holders. The plant at Ocean Falls is one of the largest pulp plants on the coast, and is equipped with modern machinery for turning out 140 tons of dry pulp per day. A lumber mill has been in active operation for some time in connection with the company, but the largest aspect of the company's enterprise was the pulp industry.

Financial difficulties arose before the plant was completed, with the result that control passed to the debenture holders in England, who had contributed $3,500,000 towards the company's capital. At the recent auction held in Vancouver, the court placed a reserve price of $3,375,000 on the plant, which includes 80,000 acres of pulp and timber leases, extensive water powers, a fleet of tug boats and launches, a townsite with a large hotel, residences, workmen's dwellings and a school house, in addition to a pulp mill and a lumber mill.

THE CHICOUTIMI PULP CO.'S ISSUE

(From Our London Correspondent).

Some weeks ago I drew attention in these notes to the fact that Mr. J. E. A. Dubuc, Managing Director of the Chicoutimi Pulp Company, was in London and that Canadians would be likely to hear something of interest very shortly. That item of interest has now come. As a matter of fact, Mr. Dubuc has been visiting Mr. F. E. R. Becker and Mr. Faithful Begg (chairman of the London Chamber of Commerce) regarding the raising of $1,200,000 in shares of $100 each for the purpose of acquiring the freehold rights of the pulp wood lands situate in one continuous block on the Peribonka and Manouan rivers in Quebec, so that the Chicoutimi Pulp Company may have a constant supply of timber and do away with the question of stumpage, which has lately been raised to an enormous sum. The investment is a sound one, and there is not the slightest doubt about the Chicoutimi Pulp Company being a well paying and prosperous concern. The Company have been so wide awake that while others were sleeping they secured with several firms in England contracts for pulp to cover ten years' supply, and the prices are reckoned to be top ones. The new company will be known as the Chicoutimi Freehold Estates, Ltd. Mr. Faithful Begg, a well-known London financier, is chairman, and the other directors are Mr. Colin McCuaig, of Montreal, and Mr. Dubuc. Mr. F. Becker, of London, the well-known pulp importer, and one or two others, buys on an average 86,000 tons of pulp from the Chicoutimi Company, out of an estimated production of 90,000 tons, so that it is necessary to study the question of pulp wood lands without delay.

PAPER TESTING AT THE U.S. BUREAU OF STANDARDS

By **FRED C. CLARK**, Director of Paper Laboratory, Bureau of Standards, United States.

The term quality, when applied to any manufactured article depends upon three important considerations, viz., Materials used; methods of manufacture, and suitability of the finished product for a particular purpose. There is a constantly growing demand on the part of the large consumer for reliable means by which he may determine quality, as it applies to the materials or articles which he purchases. The value of the testing of materials has become a recognized fact, and the nowledge thus gained is being utilized by the manufacturer as well as the consumer.

The paper industry has been somewhat slow to recognize the value of methods of testing, due in large part to the diversity of raw material that may enter into the composition of paper, and also due in part to the tremendous growth of the industry. When it is considered that this country produced less than 50 tons per day in the year 1880, while the year 1913 shows a daily production of 18,000 tons, we may realize something of the tremendous demand for paper by the country at large; and considering the demand it may be readily understood why manufacturers have not given more attention to the testing of their raw materials or their finished product. The realization of the value of accurate knowledge relating to quality in paper, has, therefore, come first from the large consumer, rather than the manufacturer, due largely to the fact that the large buyer was required to have an intimate knowledge of many kinds of paper, while the average manufacturer need only be familiar with his own product.

Determining Paper Standards.

The United States Government, in point of total value and diversity of commercial grades used is one of the largest consumers of paper in this country, and was one of the first consumers in this country to recognize the value of definite requirements for a particular use. The day of trade terms to represent a certain definite grade of paper is almost a thing of the past in this country. For example, you may purchase "bond" paper made from all chemical wood, all high grade rags, or any grade in between; the same thing holds true of many other trade papers. The question is ased at once: what is he difference, if any, and how may true of many other trade papers. The question is asked at once: what is the difference, if any, and how may this be determined? If rag stock has any advantage over chemical wood in a bond or ledger paper, then it must be worth while to have some means to determine the fibre composition in a paper. The knowledge as to fibre composition of a paper then must have some influence in regard to the quality of a paper. The term quality as applied to paper refers to its physical and chemical characteristics, which if stated in numerical values must give a ready means by which two papers may be compared.

Matching a Sample.

The Bureau of Standards is intensely interested in this whole subject of definite specifications and material testing. New testing devices and methods are being continually sought after and co-operative work is being undertaken with both manufacturers and other laboratories. The fact is coming to our attention more strongly all the time that the manufacturer who has an accurate knowledge as to his product is in a much stronger position for competition than is the manufacturer who gives little or no attention to this detail. For the same reason the manufacturer who has an accurate knowledge as to his competitor's product, or the needs of a new customer, is in much the stronger position than is that manufacturer who relies on "matching a sample" without full definite knowledge as to the particular requirements the paper must have.

A countless number of cases may be cited in which a paper buyer after several trials of different lots of paper will decide that a certain paper will meet his special needs. This particular paper he calls by a special name and then he attempts to get reasonable bids on a specification in which he has incorporated a large number of meaningless terms. A point in mind is where a manufacturer was sent a sample of very ordinary all wood machine finish printing, and was asked to bid on several pounds of one size and weight, the customer stating that the enclosed sample was an extra superfine, lithograph paper and was required to be without stretch or shrinkage in either direction and no wood pulp would be permitted. He also stated that the enclosed sample was satisfactory in every particular. Did he get the paper? he certainly did and he paid eight and one-half cents per pound, because four cents represented the cost of a special name, as he could have bought machine finish printing for under 4½ cents. But what about the unsuccessful bidder, who not having seen the sample put in a bid at 10 cents per pound with the intention of supplying an all-rag paper, which he knows from previous experience in the manufacturing of lithograph papers gives excellent results for fine lithographic printing. This is a case in which a simple definite specification could easily have been drawn up and as has been proven in later deliveries the price has been very materially reduced by the use of such a specification. This illustration is ouly a representative one of a great many cases that could be cited.

Qualities and Properties.

In this discussion of paper testing, it should be distinctly understood that the numerical values obtained as the result of physical and chemical tests upon a given sample do not cover every quality or property a paper may have. Such important properties as "color," "finish," "formation," "degree of sizing," "dirt," "rattle," and the "feel" of a paper are terms often used, and in fact it would be practically impossible to describe any paper without using one or more of these terms, yet so far no tests have been developed which will enable the testing laboratory to express these properties in numerical terms. There are no definite standards with which a paper may be compared to determine these special properties, for a set of standards that would be suitable for one class of papers, would be absolutely unsuitable for use in grading almost any other class of papers.

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*From the Paper Trade Journal, New York.

The laboratory testing of a sheet of paper then narrows itself down to determining those properties which may be expressed in numerical terms. These values are such that when due care is exercised two or more individuals using the same methods and samples and working independently will obtain duplicate results. By such methods the personal element of the individual is very largely eliminated

Paper Testing.

Paper testing may be divided into three heads as follows:

Microscopical examination.
Physical testing.
Chemical analysis.

By a microscipal examination the kind or kinds of fibres entering into the composition of a paper may be determined and the experienced individual will, with considerable accuracy, be enabled to estimate the proportion of the various fibres used. The microscope also indicates the presence of rosin size, the kind of loading material used, and the effect of the beating process on the fibres. The microscope could also be made to serve a most useful purpose to the manufacturer in helping to identify specks and dirt spots.

Physical testing includes those properties such as weight on the ream basis or per unit area, thickness of the individual sheet or the "bulk" of a certain number of sheets, bursting strength per unit area, tensile strength per unit width or per square inch of cross sectional area, elongation at rupture, folding endurance change in area due to variation in atmosphere humidity and the absorption of moisture in definite time intervals.

Chemical analysis shows the kind and amount of "sizing" and the "loading" material retained and the nature of the coloring materials used.

Microscopical Examination.

The principal purpose of a microscopical examination is to determine what fibre or fibres were used in making a paper, and then to estimate the relative proportion of each on a basis of 100 per cent for the total fibre composition. Such an examination requires the following apparatus: Beakers, test tubes, slides for microscope, two long pointed steel dissecting needles, bunsen burner, and tripod stand (or other means of heating sample), one large bottle of ½ per cent solution of caustic soda, one small bottle of 25 per cent hydrochloric acid, six small dark colored glass bottles with dropping stoppers for stains, small pieces of filter paper, and a microscope which for ordinary work should be capable of magnifying about 45 times. The binocular microscope will be found to be best suited for estimating work. Where it is desired to study the markings and special characteristics of a fibre then a microscope capable of magnifying 150 to 200 times should be used.

As all vegetable fibres are highly transparent and almost entirely colorless when seen under the microscope, it is very necessary to use some staining solution to color the fibres, in order to bring out their size and shape and general markings. The best stain for this purpose is the co-called "Herzberg" stain, which is what is known as a selective stain, that is, it has the property of giving a yellow color to most uncooked [illegible]s, such as mechanical wood; chemical wood pulps are colored an indigo blue; cotton, linen, and some other fibres are colored a wine red.

This staining solution is made up as follows:

Solution "A"—20 gms. Zinc Chloride.
10 cc. of water (preferably distilled).
Solution "B"—T.1. grms of Potassium Iodide.
0.1 gram of Iodine crystals.
5 cc. of water (preferably distilled).

Dissolve "A" by adding the water to the zinc chloride in a glass beaker. Dissolve "B" by adding a few drops of the water to the potassium iodide and iodine crystals in a glass beaker, and after dissolving add the remainder of the 5 cc. of water. The two solutions—"A" and "B" are then mixed together and allowed to stand 24 hours to settle, after which the clear liquid may be poured off and divided between two of the dark blass bottles with the dropping stoppers. All iodine solutions will fade in light, and should, therefore, be kept in the dark as much as posisble.

It is a very good plan to use two more of the dropper stopped bottles to keep a concentrated solution of zinc chloride and water in one and a concentrated solution of zinc chloride and water in one and a concentrated solution of potassium iodide and iodine in water in the second; these two solutions will be found convenient in adjusting the Herzberg stain.

How to Make a Microscope Test.

The preparation of a sample of paper for the microscope is as follows:—Several small pieces of paper of about the area of a cent are cut from different parts of a sheet of paper. These pieces are then placed in a beaker and covered with some ½ per cent solution of caustic soda, and the whole mass is then brought to a boil over a suitable heating device. After boiling for about a minute, the liquid is poured off and some tap water added to wash out the caustic soda, and two or three drops of a 25 per cent solution hydrochloric acid added to neutralize the alkali.

The slightly acid solution is then poured off and enough of the small pieces of paper are pinched off and rolled into a ball of about the size of a pea. This small ball of pulp should be well rolled between the thumb and finger, and then placed in a test tube, and the test tube about half filled with water. Care must be exercised to rinse the hands after working each sample, to keep from contaminating the sample following. The test tube is then shaken vigorously, until the paper has been entirely broken up and the fibres are well separated. A few fibres are next removed with the point of the microscope needle from the test tube, and a small sample is placed on each end of the microscope slide. The slide should be held in the holder over some black surface, as it is a great help to the eye to look at white fibres against a black background. The wet fibres on a slide may best be dried by covering them with good filter paper and left to dry for a few minutes in the air.

The fibres are thoroughly dried and a drop of the Herzberg stained is added, and the fibres are well "teased" out by the use of two microscope needles, a cover glass is placed upon the fibres and well pressed down, all the stain pressed out around the edges of the glass being removed with filter paper, and the slide polished with paper or cloth.

The slide is next placed under the microscope and after studying the various fields, an estimate of the proportion of each of the various kinds of fibre may be given.

It is best to use four stains for this work, that is, each stain is of slightly different strength as each one gives the best results on certain fibres. For example: a stain that clearly brings out the wine red color on cotton and linen fabrics, as a rule usually does not give the best blue color on bleached soda and sulphite pulp; this same stain on ground wood pulp has almost no effect at all.

In making up a stain to produce the best color on the particular fibre, the following points should be remembered:

Two or three drops of water added to a good stain for rag and bleached chemical wood will tend to fade out the wine-red color, the blue will remain nearly unchanged, and the yellow color on ground wood will be brought out very much clearer. In other words, a good rag stain when used on ground wood, produces produce a deeper blue on chemical wood fibres.

The addition of two or three drops from the bottle containing the concentrated solution of iodine and potassium iodide in water, will produce a deeper wine-red on rag fibres, while the addition of a few drops of concentrated solution of zinc-chloride in water will produce a deeper blue on chemical wod fibres.

It should be remembered that these iodine solutions will continually fade out and that the best results may only be obtained when the stains give the proper colors.

The easiest and best way to secure a stain of the right coloring capacity is to keep on hand the following pulps: Bleached soda and sulphite pulps, unbleached sulphite, ground wood and beaten rag stock. The rag stock may most easily be secured by using a sheet of good quality filter paper, which is always made from "all-rag" stock. Now take small bits of the bleached soda and bleached sulphite pulps and thoroughly mix them, after first separating them in water in a test tube. Place a small sample on a microscope slide, thoroughly dry the fibres, add one drop of stain, separate fibres with the needles, place cover glass in position and place slide under the microscope. Each fibre seen should be of a blue color, the sulphite fibres appearing much wider and longer than soda fibres, and should show a lighter blue color, as the fibre is more translucent than a soda fibre, while the soda fibre should take a darker blue color.

Soda and sulphite fibres should show a slight color difference, the soda fibres being colored a darker indigo blue, while sulphite fibres should be colored a lighter indigo blue. If this color difference is not clearly brought out, then either water or zinc chloride solution should be added, depending whether it is desired to weaken or deepen the colors.

Some rag fibres should now be added to the test tube, and a second slide made up, using a bottle of stain which is intended to produce best results on mixtures of rag and wood pulps. This second stain is adjusted by adding water, zinc chloride, or iodine-potassium-iodide, or all as may be needed until the three fibres, soda, sulphite, and rag, are all clearly brought out.

A third stain should be prepared for such papers as contain ground wood by using a mixture of ground wood and sulphite (unbleached) and then adjusting the stains to give the best colors. The proper color for ground wood is the lemon-yellow, never an orange-yellow, as then the sulphite pulp is too slightly colored and ground wood estimates are necessarily too high.

The experienced man may by using this method give some very surprising results. The Bureau of Standards believes that in papers containing mixtures of rag and bleached chemical wood, a careful microscopical estimate is well within 5 per cent of the correct fibre contents. For papers containing ground wood, especially where the percentage of ground wood is high, then the degree of accuracy is within 10 per cent of the correct fibre contents.

Physical Testing.

For laboratory use the quickest sheet-weighing device is the quadrant paper scale, so graduated that the corresponding ream weight—either 500 or 480 sheets—is read off directly in pounds.

Thickness of paper may best be determined by the use of a spring micrometer having a hand that travels around the circular dial. This dial is graduated into thousandths of an inch and may be read to ten thousandths.

Care should be taken to see that the pressure on the paper is constant, and also that the pressure surfaces are large enough not to compress the paper.

The bursting strength of a paper is determined with a machine by which the paper is firmly clamped against a rubber diaphragm through which the pressure is applied to a circular area of the paper measuring one square inch. The actual pressure of the liquid under the rubber diaphragm required to burst the paper is registered on a carefully calibrated pressure gauge, reading pounds per square inch. An average of ten readings is taken as the correct bursting strength.

The tensile strength of a paper is determined upon a suitable machine, capable of accurately recording the tension required to break a strip of paper, when held at each end by suitable clamps and the clamps are moved apart until breaking of the paper occurs.

The folding endurance is measured on a machine in which a strip of paper of definite size is clamper. The clamps are held apart under definite tension and the paper is caused to bend back and forth upon itself, until the fibres wear through at line of folding. The number of double folds is recorded automatically by a suitable device.

Expansion of a paper may be determined by submitting the paper to different atmospheric conditions and noting resultant size of sheet at each change in the atmosphere.

The measure of absorption of a paper is the height to which, in a given time, a liquid will rise by capillary action, when one end of a vertically held strip of paper is immersed in water. This test as well as all physical tests must be made under a uniform condition of humidity.

Chemical Analysis.

An ash determination is made by igniting a two gram sample in a porcelain crucible until residue contains no carbon. The crucible is allowed to cool in a dissector and then weighed and the weight of the ash divided by two and multiplied by 100 gives the per cent of ash retained in the paper. This result includes the per cent natural ash of the fibres plus the per cent actual loading material retained. The character of the loading material may be determined from the ash by either chemical methods or by the use of the microscope.

Quantitative Determination for Rosin and Glue.

The quantitative determination for rosin is made as follows: A five gram sample is cut into strips and the strips folded back and forth upon itself, and then placed in a 300 cc. Erlenmayer flask. The paper is extracted with alcohol made acid with acetic acid.

The extract is next transformed to a casserole and after evaporating off the alcohol, the acid residue is taken up in water and extracted with ether in a separatory funnel. Three extractions are sufficient, and the combined ether extracts are washed twice with water and transferred to a weighted dish. After evaporation to dryness the residue is evaporated with absolute alcohol to remove water and heated in an air bath at 90 degs. C. for one hour.

The dish is then allowed to cool in a disiccator and weighed. The resultant weight in grams divided by 5 and multiplied by 100 gives the per cent total rosins.

One of the simplest tests for the presence of rosin sizing is to place a drop of ether on the paper. The presence of rosin sizing will be indicated by the formation of a ring around the edge of the spot after the ether has evaporated.

A quantitative determination for glue may be made by extracting a sample of the paper with warm water and precipating the glue with tannic acid or phosphomolybdic acid. The precipitate that forms is an indication of glue in the paper.

Glue may be determined quantitatively from the nitrogen factor, by the well-known Kjeldahl method.

Causes of Rejections.

In regard to the acceptance and rejections of paper by the Government Printing Office, it will no doubt be of considerable interest to the entire trade to mention some of the causes for the rejection as well as what point seems to cause most trouble to the government contractor. The deliveries so far for the present contract year show that approximately 87 per cent of all the paper delivered to the Government Printing Office was found to "Conform to the standard samples and specifications in every particular." Of the 13 per cent which was rejected, over 36 per cent of this total was rejected on account of color, finish and formation, and of these three, color seems to be much the greatest cause for rejection. The requirements that appears to be the second hardest to meet was bursting strength. In this case 17 per cent of the total number of rejected papers was rejected due to papers being below requirements. An excess of rosin size was responsible for 2 per cent of the total rejections, while an excess of ash and a deficiency in fibre composition was responsible for 5 per cent and 9 per cent rejections respectively.

A number of rejections were such as could only be classed as carelessness on the part of the manufacturer. By this is meant such things as failure to watermark when so ordered and where the specification definitely calls for watermarking with the great seal of the United States. Rejections were also made in certain lots that were received with the great seal watermark, yet no watermark was required and a watermark of any kind made the paper absolutely unsuited for its particular purpose. Careless wrapping and packing, in cases several inches too large, so that the paper slid around in the case and was badly damaged in transit, was also the cause of several rejections.

From the foregoing list of causes of rejection the two most important points for the attention of the paper maker are color and bursting strength, for on thes two reuirements over one-half the total rejections occur. This does not mean that finish, formation, dirt, etc., are not important, but that the paper maker succeeds in these requirements more often than in the matter of color and strength.

It is a well-recognized fact that a bursting strength requirement for papers is not considered by the paper trade as one of the more important points. For this reason the bursting strength requirement in the Government Printing Office schedule and other governmen schedules for paper supplies has been looked upon with disfavor by the paper trade. To some the impression has been gained that the addition of a bursting strength requirement was an attempt to impose a hardship on a contractor. In regard to this point, I wish to give special emphasis to the fact that more time and attention has been given to this one part in the specification than has been given to any other. And the minimum limit has been established only after a long series of test on actual deliveries. The records of tests on deliveries for the past two years show results that fully justifies the requirements adopted, as only in very few cases has it seemed advisable to change the specification requirement.

For the convenience of the Paper Laboratory, the ratio of bursting strength to ream weight has been calculated on the 25 x 40 size, and the resultant figure is expressed in per cent. For example, lots 50 to 53 inclusive—white tablet writing, all wood, is required to have a minimum of 17 points on a 48-pound 25 x 40 size; this gives the ratio 35.4 per cent. With this ratio the required minimum bursting strength for any other weight under this item may be readily found by multiplying the ream weight on 25 x 40 by the ratio 35.4 per cent, and the result is bursting strength required. Lots 56 to 62 inclusive—50 per cent rag writing, machine-dried and supercalendered, is required to have a ratio of 36.7 per cent, equal to 1.1 points per pound on a size 16 x 21 inches. Lots 63 to 88 inclusive—75 per cent rag writing, tub-sized and air or loft-dried, the ratio is 58.5 per cent, equal to approximately 1¾ points bursting strength per pound on a ream 16 x 21 inches. Lots 94 and 95—thin bond, highest grade, must have a ratio of 76.7 per cent, equal to 2.3 points bursting strength per pound on a ream 16 x 21 inches. Lots 96 to 99—Bond, all rag, the ratio is 74.2 per cent, equal to 2¼ bursting strength per pound on a ream 16 x 21 inches. Lot 100—Highest grade bond—the ratio is 83.4 per cent, equal to 2½ points bursting strength per pound on a ream 16 x 21 inches. Second-class ledger is required to have a ratio of 58 per cent, equal to approximately 1¾ points per pound, 16 x 21 inches, and first-class ledger has a ratio of 85 per cent, equal to approximately 2½ points bursting strength per pound, 16 x 21 inches.

Uniform Testing Methods.

It is the firm belief of the Bureau of Standards that all manufacturers and users of paper will readily recognize that a correct set of definite chemical and physical tests when carried out under uniform condition, will give more liable results than could be obtained in any other way. It is also the belief of the Bureau of Standards that a knowledge as to the nature of our methods of paper testing as well as the manner in which a paper specification is developed, will tend to convince the trade of the fairness with which this work is carried on.

It is not meant that a set of tests will tell all about a paper, but that a set of definite tests, together with a judicial exercise of judgment in regard to color ,finish, formation and dirt, will tend to promote fairness to all concerned. The government fully recognizes the fact that whenever a paper specification imposes a hardship or restriction upon bidders in an unnecessary manner, that same restriction will necessarily tend to raise the price of that particular grade to the government.

It is the belief of the Bureau of Standards that only by earnest co-operation between the government testing laboratories and the manufacturers may the most desirable paper specification be developed. The greatest degree of co-operation will come when manufacturers understand that their comments or criticism on any point will be given the fullest consideration by the Bureau of Standards. Such discussions invariably develop much valuable data, and the results are beneficial to all concerned.

Summary of Court Decision in Spanish River Case

As announced in the last issue of the Pulp and Paper Magazine, the Customs Court of the United States reversed the decision of the Board of General Appraisers which allowed the free entry of paper manufactured by the Spanish River Pulp and Paper Co. from pulp wood grown on Crown Lands of Ontario upon which the Government had removed the Provincial restrictions in favor of the owner. The Customs Court in summing up the issues under consideration, says:—

"On the 25th day of November, 1912, the importer was the owner, subject to the conditions and provisos contained in the written instruments relating thereto, of certain concessions or grants of the right to cut pulp wood and other wood upon large tracts of Crown lands in the Province of Ontario for a period of substantially twenty-one years, which has not as yet expired. The enjoyment of these concessions by the importer was upon the condition, among other things, that it should establish and equip in Canada pulp and paper mills at an expense of at least $1,5000,000 (and which appear in fact to have required an outlay of upward of $3,000,000), and that it should continuously maintain and operate the same to the extent of pro ducing annually at least 35,000 tons of pulp and paper, and that it should employ on an average 400 hands in connection therewith. The concessions prohibited the importer from cutting wood on the lands covered thereby for the purpose of exporting the same in the wood and from selling the same to other persons for export in that condition."

The Spanish River Mills protested to the Canadian Government that under its agreement it was forced to pay a duty on all of its shipments of paper to the United States, and that therefore it was unable to compete with other Canadian mills. The Minister of Crown Lands then met with the officials of the Spanish River Mill and a new agreement was drawn up, which gave to the Spanish River Company the right to export pulp wood and a general release from all Crown land restrictions, provided that the mill agreed to erect and equip two additional machines at its Espanola Mills, increase its production from 35,000 tons of pulp and paper a year, and to employ at least 1,000 hands in the woods. This the Spanish River Mill agreed to do, and Judge Barber, of the Customs Court, commenting on this agreement, says:

"It is manifest that the installing of the additional machines, the employment of the additional help, and the production of the increased output are all new conditions to be performed by the importer in order that he may enjoy the right to export, and is a continuing consideration therefor.

"A restriction means a restraint, a limitation, a confinement within certain limits, and one can hardly refrain from querying if it was intended by the contract of November 25 to remove all restrictions upon exportation, why it was not stated in simple language in substance that the Spanish River Pulp and Paper Mills, Limited, was thereby unconditionally relieved and released from the prohibition of export in the earlier contracts provided, notwithstanding anything therein contained to the contrary. This would have left the company entirely free to cut and export pulp wood if it so desired without compelling it to return, yield or pay any consideration therefor, and would have clearly accomplished what it is urged was accomplished. The importer could then have exported all or any part of the pulp wood cut by it upon crown lands without incurring any liability to have its rights under various grants terminated by reason thereof. In other words, its right to export would have been wholly free and unrestricted.

"But the parties instead of this elected to contract that certain conditions, some new, some old, and all to be observed and performed by the importer, should be the consideration for the abrogation of the prohibition of export and of the grant of the right thereof.

"It follows, therefore, that whether these importations are a part of the required annual product of 50,000 tons or are a part of an excess thereof (the evidence is silent on this question), they are not entitled to free entry as claimed, because the importer has not an unrestricted right to export pulp wood from which they are manufactured.

"The conclusion we reach is really giving effect to the intent of the parties of the contract, because on one hand the importers object in executing it was to obtain so far as it might the naked right of export without intending to exercise it to any substantial degree, but for the purpose of enabling it more successfully to compete with other Canadian manufacturers; on the other hand, the Government's intent was to see to it that but little pulp wood was exported as a consequence of its being entered into, and to make certain this result the Government by the contract armed itself with, or rather, expressly reserved to itself the right, from time to time and for any cause appearing to it to be sufficient, or by order-in-council, to make regulations and impose restrictions not only upon the exportation of pulp wood, but of any other wood or timber cut on said concession land.

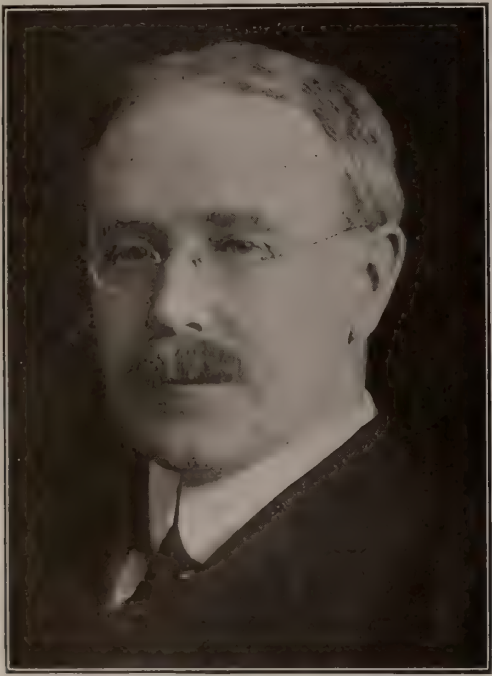
"We are all impressed with the view that the effect of the contract in question was to clothe the importer with the nominal but not the real right of unrestricted export of pulp wood, and that the construction thereof claimed by the importer would result in an evasion of our statute, which is designed to prevent restriction of every kind of export of pulp wood from Canada and its provinces, and gives free entry only to pulp wood and certain of its products when the wood is entitled to unrestricted export. We are unwilling to either adopt such a construction or assent to such a result."

Who's Who in the Canadian Paper Industry

T. J. Stevenson, Sales Manager, Riordan Pulp and Paper Company.

By W. A. CRAIK.

If Morse had not invented the telegraph, it is quite within the possibilities that T. J. Stevenson might never have entered the pulp and paper manufacturing industry, but might have driftd into some other occupation less suited to his particular capacity. The way of it was this: As a boy he had mastered the mystery of key and sounder in the local office of the Montreal Telegraph Co., at Kincardine, Ont., where his family were living at the time. Presumably he intended to make it his calling in life, but fortunately for him fate whisked him off to Merriton and at Merriton his familiarity with the instrument was the means of introducing him for the first time into the inside of a paper mill.



The Riordan mill at Merriton sported a wire over which the office sent and received messages, made quotations, and generally kept in touch with the paper market, and it was to operate this wire that young Stevenson was engaged thirty-four years ago. The particular work of sending messages did not consume much time, and in the intervals he was employed as a regular clerk in the office. Being a bright youth and showing himself capable, he got along rapidly and eighteen years after he had entered the mill in a junior capacity he had risen to be its manager.

Mr. Stevenson hails from Welland County, Ontario, where he was born within sound of Niagara Falls. His father was engaged in the contracting business under John Brown, of Thorold, and being employed in various government jobs, which necessitated his moving about from place to place, his son led a varied existence as a boy. The family resided at one time or another at Chatham, Goderich, Kincardine and Thorold, and Mr. Stevenson had a taste of schooling in all these places. Whether these frequent changes of scene had anything to do with the development of a most versatile and agreeable character, is open to debate.

With the Riordan Company the ex-telegraph operator has made solidly good and is to-day one of the strong men of the organization. On the completion of the company's Hawkesbury mill he was transferred from Merriton to the new property and remained there as manager for five years. In the interval the general business of the company had grown to such an extent that the appointment of a regular sales and traffic manager was deemed necessary and the choice of the management fell on the energetic superintendent of the Hawkesbury plant. He was brought back to Merriton, where he commenced his new labors, and later was transferred to the head office in Montreal, his present headquarters.

The Riordan Company, as is generally known, were the pioneers in the manufacture of sulphite chemical pulp in Canada, and to-day an important department of their activities is the supplying to paper manufacturers all over North America of this basic product. The duties which Mr. Stevenson performs in superintending this sale are of the most onerous description. It necessitates a great deal of travelling throughout the United States and Canada, besides a close attention to trade conditions, particularly relating to tariff. During the reciprocity negotiations and subsequently, when the United States tariff was under revision, he had his hands full in looking after the interests not alone of his own company, but of the Canadian pulp and paper trade in general. In this work he has proved himself to be a born diplomat and the trade owes a great deal to his skilful handling of a very difficult situation.

"My belief is," declares Mr. Stevenson, "that what is good for the business of a country is likely to be best for the country's general interests. That is why I have always been a staunch Conservative, because I am convinced that a policy of protection is the best thing for Canada."

During his connection with the Riordan Pulp and Paper Co., Mr. Stevenson has seen that company's operations expand enormously. When he first entered their employ the mill at Merriton was producing about ten tons of news and wrapping paper per day. Compared with present production this seems small, but in 1880 it was the largest output of any Canadian mill. To-day the Riordan Company does a business of 50,000 tons per annum, the largest of its kind in the British Empire. The share which Mr. Stevenson has taken in bringing about this result has been by no means small.

Affability is an outstanding Stevensonian characteristic. He does not hedge himself around with a wall of self-importance nor manage his office on formal lines. He is approachable at all times, frank and open in manner, and with something of Pickwickian benevolence shining from his eyes. His smile is contagious. It draws up his face into wrinkles, closes his eyes behind their glasses and makes his whole countenance merry. Small wonder is it that everyone speaks well of T. J. Stevenson and is glad to call him a friend.

He belongs to the old school of business men whose loyalty to the company for which he works transcends all other interests. He has given thirty-four years to the service of the Riordan Company and he does not grudge a day of it. He is careful, conscientious and a hard worker, deriving his greatest satisfaction in seeing the business prosper under his guidance. His duties require a world-wide familiarity with conditions in the trade, and few men in Canada have a broader grasp of the situation than he.

Mr. Stevenson's choicest diversion is to go on a fishing expedition. He belongs to several clubs of anglers and delights in getting out into the woods in springtime and whipping the brooks for trout. Of more formal sports his favorite recreation used to be lawnbowling, which he pursued with considerable zest when he was living in Merriton. This he has had to give up since he went to Montreal. His chief intellectual pleasure has been derived from his Masonic work. He has risen to high rank and is a most loyal Mason, sacrificing a great deal of his time to the interests of the Order.

He is a first cousin of Eliot G. Stevenson, the noted Detroit lawyer, now head of the Independent Order of Foresters. The relationship is a doubly intimate one, for both men's fathers were brothers and their mothers sisters. T. J. Stevenson resembles his cousin somewhat in appearance and possesses a good many of his characteristics. He has one son, who, after a course at Ridley College and McGill University, is now going in for a business career in Montreal.

In bringing about the recent organization of the Canadian Pulp and Paper Association Mr. Stevenson was one of the most active members of the trade, and he has subsequently given most loyal support to its work. He is now chairman of the Chemical Section.

Leather Board

Genuine Leatherboard, in other words board made from real leather scraps is made as follows:—

According to a tried-out system the leather scraps consisting of old belting, shoes, etc., are first cleaned by hand, sorting out all foreign matter such as nails, wood, strings, etc.—Next the scraps are sorted as to color in three piles, i.e., blacks, mediums, and whites.

A Ragcutter of strong and heavy construction—sometimes a rope-cutter is employed—reduces the leather scraps to palm-sized pieces. In case such cutting machinery is not available the leather scraps can be cut by hand with a hatchet or a knife on wooden blocks, however, care must be taken that no wood splinters get into the leather. These small pieces are then put into old jute bags or wicker baskets and soaked in water—a nearby river or pond—for a period of 10 to 14 days.

The water has a different influence on each of the three kinds of leather. The blacks will float during the entire time of the soaking, absorbing but little water, the softer mediums absorb the water very readily and soon sink to the bottom, their volume increasing greatly, finally the white leather will float a few days before settling down.

During this soaking process various coloring of the water will be experienced, which is due to the different kinds of tanning the leather. Thus the white leather will give a greenish-yellow tone, the black leather will produce a light brown coloring, while the mediums will turn the water dark brown. Such prolonged soaking will remove all impurities such as oil, grease, paint, etc., besides it tends to loosen up the fibres, thus aiding in the disintegrating of the material.

The water-soaked leather is then transferred into a vat, excessive water being allowed to drip off. In case the leather still seems to be too dirty and somewhat stiff a solution of 15 kilos lime and 5 kilos soda to each 100 kilos of leather is poured over same. Should the leather be soft and fairly clean either the lime or the soda solution will be used. The scraps must be entirely covered. The leye will be permitted to work for a period of from 24 to 36 hours, after which same will be run off. Warm water is used for washing purposes, this being done either in the same vat or in a wash-hollander until the wash water remains clear.

The leye will destroy some of the leather color, however, this is of no importance in the ensuing process. Through heating the leye with steam up to a temperature of 20 deg Cent., the leather will readily become softened. A higher temperature than 20 deg. Cent., will convert a considerable amount of the leather into glutinous matter, consequently such excessive heating must be avoided.

The leather scraps are now ready for the beater. This process takes considerable time, i.e., 8 to 10 hours. Since the stuff shows a tendency to settle down it is necessary to keep it well stirred up. The work of the beater wil lproduce a rather fine stuff which, when diluted in water will show no real fibres like ordinary paper stuff, but a granulated appearance with an occasional baggy enlargement. The latter represent parts not fully disintegrated by the beater. The typical absence of any fibfires is due to the leye treatment.

Inasmuch as the leather itself contains enough of glutinous matter there is no need of sizing the stuff. Likewise no mineral filler is used nor any coloring done. As soon as the stuff is beaten enough it is run into the machine chest. Owing to the nature of the stuff the wire will easily become dirty, and a continuous cleaning with high pressure water showers is imperative. Furthermore the stuff shows quite a tendency to adhere to the wet-felts, consequently only such with as little nap as possible ought to be used. The felts must be gept rather wet especially when starting the machine. With very evenly adjusted presses the couching much not be excessive. The stuff being rather "slow" will retain the water to quite an extent, very little draining through the wire, consequently a moderate speed must be employed. In order to ensure a quicker drying of the sheet it will be found advisable to slightly heat the stuff in the machine chest.

The boards as they come off the size roll will then be piled up with alternating equal sized cuts of some cotton material to be subjected to a press. After this they are ready for drying, which is done most effectively in so-called "Reform" drying channels which prevent warping.

The disagreeable qualities of the leather board can be eliminated by adding some ground wood or chemical pulp. The beating of the ground wood or the chemical pulp will be done separately. After which same is added to the leather stuff and thoroughly mixed in a mixing hollander. Through such adding of other kinds of fibre to the leather stuff a a pliable and soft board will be produced, especially when soda pulp is used, likewise with a long fibre ground wood good results have been obtained.

Leather scraps being a rather cheap material, and also taking into consideration the more or less simple process of converting same into board, it ought to be remunerative to use same more extensively.

For quite a few kinds of special boards exceedingly good results are obtained. Although the loss of raw material is rather heavy, still the use of same is to be recommended on account of the cheap price.

BRITISH TRADE NEWS

SPECIAL TO PULP & PAPER MAGAZINE

British Paper Makers' Association

ANNUAL MEETING IN LONDON

(By Our London Representative).

The annual meeting of the Pulp Makers' Association of Great Britain and Ireland (1812, incorporated), was held in London on April 23rd. There was a small gathering of the members, over which Mr. Lewis Evans, F. S. A., presided, and, as usual, the most important business was conducted in camera, or within closed doors, so that the special features of the meeting are as secret as the grave.

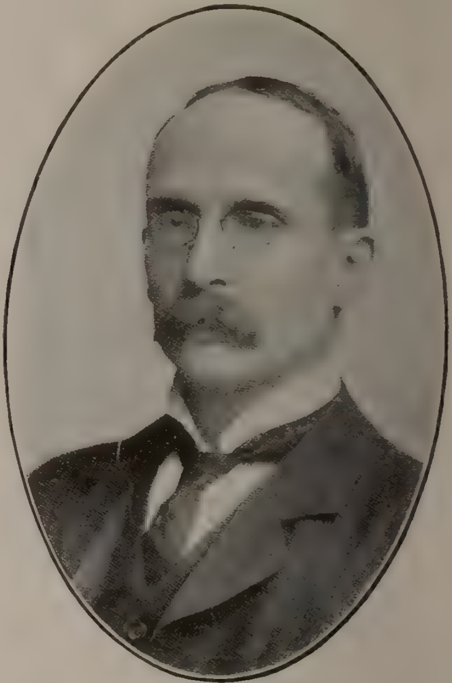
The annual report stated that the Association had 126 members, and then it went on to deal with the wood pulp contract question between Scandinavia and the British Pulp Association, which is not yet settled, and reference was also made to increased railway rates in the United Kingdom, workmen's compensation insurance, statistics, and other unimportant matters of no interest to the trade in Canada. Touching on technical education, the report said: "A marked improvement was noticeable in the classes for technical education in paper-making held under the auspices of the City and Guilds of London Institute, which the Association encourages by grants, prizes, and certificates. One hundred and ninety students attended the classes, as compared with 147 in the previous session, and out of 46 candidates presenting themselves for examination, 27 passed." I simply quote the paragraph in the report to show the interest that is taken in paper making technology and to show that the British paper maker is anxious that the coming generation will have a practical as well as a technical knowledge when they will be thrown on their own resources in the industry. Canadians would do well to study this paragraph.

The President, in his opening address, said the annual report was short and business-like, and set forth most of what was done in 1913. One of the most important things before the Association was perhaps the increased railway rates. It was a matter that had been before the Council of the Association and a substantial grant had been made to one firm to aid them in fighting a legal case.

Next business was the election of officers for 1914-15 and this resulted as follows:—Lewis Evans, president; Colonel John Birrell and Joseph Dixon, vice-presidents; Herbert Green, treasurer; A. W. Foster, B. A., secretary.

As great interest is now being taken in the opening up of water-ways throughout England and old disused canals, the Association had an expert in attendance to address the members on "Our neglected waterways." The subject has been revived by the high railway charges that now prevail, and Mr. Impey, the expert from Birmingham, said that from a few figures supplied him he formed the opinion that the tonnage moved by the members of the Paper Makers' Association in England in raw materials, coal for manufacture and finished articles would be well over three million tons per annum. So that the question was evidently one of much importance to paper makers who, along with other trades, were suffering at the hands of the railway companies. Railway rates and charges were next discussed, after which the Association took up the mill workers' demands for a trade union label on all British-made paper and the infringement of trade customs. When these questions came up the representatives of the press were asked to retire, so we missed the tit-bit of the whole of the proceedings. The policy of this Association is to discuss as little as possible openly and publicly any question of importance and it is that policy that detracts membership and leaves the Association open for criticism. One can understand private things being discussed secretly, but to close the doors on a topic like the trade union label —particularly when people are looking to the Association for a lead on it—it seems ludicrous that no statement emanates from any member on the subject.

But while the Association adopted a strange attitude on the trade union label question, their action in regard to the dinner held at the close of the annual meeting was equally inconsistent. The committee in charge decided to curtail the attendance to paper makers and their guests, the result being that, instead of 200 or 250 being present, only about 100 sat down to dinner, and from this 100 I subtract two newspaper proprietors, three newspaper reporters, and about five or six other newspaper officials, which brings the total down to about 89 paper makers and members of the allied trades. All the big wood pulp men like Fred. Becker were absent, and the whole dinner lasted a little over two hours. The Association wants new members and one would fancy that a good dinner would be the means of dragging in new blood. Lewis Evans presided also at the dinner, and the speech of the night was made by Mr. Godfree, the president of the British Wholesale Stationers, who in proposing the health of "The Paper



Mr. LEWIS EVANS, F.S.A.
President, British Paper Makers' Association

Trades and the Paper Makers' Association,'' said individual competition might be brought earlier to the notice of the wholesale stationer than it reached the paper manufacturer, but the stationer endeavored to bring it to the manufacturer's notice in as amiable a way as possible, and there was one thing to be found and that was, that British manufacture was still an important element in the paper trade not only in England, but in the colonies and other countries as well. British manufacture was an enormous asset in the pepar trade and it assisted the Wholesale Stationers to a very large extent. He was one of those who was most anxious to increase prices, but he was not altogether certain that the British paper maker had been a little premature in what they had done in regard to prices. At all events, the results had been satisfactory to the manufacturer, but very troublesome to the wholesale stationers. Whatever the position might be, he was not depressed about the position or future of the British paper trade. He looked on it as one that must go on increasing every year. The demand for paper was certain to increase, just as sure as the sun will rise in the morning. He thought there should be more consultations between the stationers and the paper manufacturers, as something would be bound to arise for the benefit of both. Mr. T. Y. Nuttall responded to the toast and said he agreed with Mr. Godfree. He was inclined to think that if the energy and force put into things by the German paper trade in its exploration of foreign trade and exploitation of the resources of paper were adopted by the British paper makers and the wholesale stationers, things would be more profitable in the interests of both parties.

Mr. Joseph Dixon proposed the health of ''The Allied Trades,'' and said he felt like the patient who consulted his medical adviser. He told of all the aches and pains and then the medical adviser, like Mr. Godfree, gave a diagnosis Mr. Dixon then impressed on all paper makers the necessity to combine together as one man to fight, if necessary, either the coalmen or the wood-pulp men, and until they were so organized they would be perfectly useless. Mr. Fred. Bowater, brother of the Lord Mayor of London, and a member of Bowater & Sons, paper agents, replied to the toast.

Mr. W. L. Tod, one of the Scotch paper makers, pro- the health of ''the President,'' and Mr. Evans suitably responded.

British Imports of Pulp

(From Our London Correspondent).

Statistics showing the quantities of pulp imported by the British importers and agents are now ready and the following are the principal items:—Becker & Co., Ltd., chemical pulp, 59,653 tons; mechanical, 171,285 tons; total, 230,938 tons. J. E. Salvensen & Co., Ltd., chemical, 15,001 tons; mechanical, 16,934 tons; total, 31,935 tons. W. G. Taylor & Co., Ltd.. 15,003 tons of chemical and 7,060 tons of mechanical. Churchill & Sim, chemical, 16,355 tons; mechanical, 8 tons; total, 16,363 tons. Henderson, Craig & Co., Ltd., chemical, 10,471 tons; mechanical, 2,029 tons; total, 12,500 tons. Greenhalgh & Co., chemical, 10,420 tons; mechanical, 450 tons; total, 10,870 tons. Holm & Co., Ltd., chemical, 6.087 tons; mechanical, —— tons; total, 6,087 tons. Friedlander & Co., chemical, 3,694 tons; mechanical, ——; total 3,964 tons. W. Grant & Co., chemical, 3.644 tons; mechanical, 503 tons; total, 4,147 tons. Alsing, & Co., Ltd., chemical, 2,050 tons; mechanical, ——; total, 2,050 tons. Gordon, Watts & Co., chemical, 1,317 tons; mechanical, 744 tons; total, 2,061 tons. Stora Kopperbergs Agency, Ltd., chemical, 1,398 tons; mechanical, ——; total, 1,398 tons. R. Erikson & Co., Ltd., chemical, 656 tons; mechanical, 378 tons; total, 1,034 tons. Price & Price, chemical, 215 tons; mechanical, 1,013 tons; total, 1,228 tons. S. W. Roys & Co., chemical, 212 tons; mechanical, ——; total, 212 tons. Camia Timber Co., Ltd., chemical, 75 tons; mechanical, ——; total, 75 tons. T. T. McCrow, chemical, 50 tons; mechanical, ——; total, 50 tons. Amongst the papermakers Ed. Lloyd, Ltd., heads the list with 20,360 tons chemical and 88,654 tons mechanical, making a total of 109,014 tons. A. E. Reid & Co., Ltd., come next with 23,224 tons of chemical and 52,862 tons mechanical, a total of 76,086 tons. T. Owen & Co., Ltd., of Cardiff, are third on the list with 6,966 tons of chemical and 12,119 tons of mechanical, a total of 19,085 tons. The Imperial Paper Mills at Gravesend is next with 11,978 tons of mechanical and 500 tons of chemical.

Ottawa Notes

GOVERNMENT OWNERSHIP OF WATER POWERS.

Ottawa, Ont., May 10.— Will the Dominion Government, which has already taken an advance step by reserving all the water powers on Crown lands in Canada, go in for Government ownership of water powers?

This is the interesting question which arises as a result of some statements made by the Minister of the Interior, Hon. Dr. W. J. Roche, in Parliament last week, in regard to Western water powers, and the action of his department in reserving them instead of disposing of them to pulp and paper manufacturers. The matter was brought up by Mr. J. A. M. Aikins, of Brandon, in connection with the discussion of a new Dominion Lands Act. Mr. Aikins dealt with the exploitation of the water power resources of the West by private capital, and pointed out that the Winnipeg River alone posesssed a potential horse-power of over half a million. He urged that the Dominion revenues be spent for the development of these water-powers, and stated that the regulations governing their use in the West were not nearly so satisfactory as in Ontario under the Hydro-Electric Commission.

In reply, Hon. Dr. Roche stated that with regard to the Winnipeg River it was the policy of the department to conserve its waterpower although fifty per cent. of this had already been alienated. ''It is a question as to whether we are prepared to go in for Government ownership of waterpowers,'' he said. ''I do not see whether we are that far advanced; I do not think we are at the present time, but I can see the propriety of conserving these powers, and not allowing them to get into private hands for exploitation. As regards the Winnipeg River, there have been applications from private capitalists for these waterpowers with stipulations that they would erect large pulp mills on that river. But after consulting Judge Robson, the utility commissioner for Manitoba, who is opposed to the alienation of any of these waterpowers, I thought it wise to carry out his recommendation.''

Protective Association Formed.

The Lower Ottawa Forest Protective Association, Ltd., a new organization with headquarters in Hull, Que., has been incorporated under Quebec legislation by lumbermen and paper manufacturers from the Ottawa Valley, who desire to protect their valuable timber limits therein from fire. The incorporators are Senator W. C. Edwards, W. C. Hughson, of Ottawa; J. B. White, Montreal Robert MacLaren, Buckingham, Que.; G. H. Millen, of Hull, Qu. The association will organize an efficient fire protective system on the Gatineau, Lievre, Rouge and North Nation Rivers; supervise the timber lands owned by members of the association, and in ways legislative and educational promote their interests.

Tariff on Caustic Soda Raised.

A tariff change which will affect Canadian pulp and paper manufacturers, according to the statement of the Minister of Finance, Hon. W. T. White, in the House of Commons a week ago, is that on caustic soda when imported into Canada.

Caustic soda is a fairly large item in the manufacture of paper, and when this schedule came under discussion in Parliament, members of the Opposition desired to know whether it would affect the industry. The Minister of Finance replied that though the price of caustic soda in Canada would go up with the increased tariff in force, he did not think the effect on the pulp and paper trade would be prejudicial. Caustic soda in less than twenty-five pound packages is now dutiable at 3-10 cents per pound, instead of free, and in more than twenty-five pound packages at twenty-five, instead of fifteen per cent. when imported from the Unitd States.

Power Bill Passed.

The bill of the W. C. Edwards Company, of Ottawa, which, as stated in a previous issue of the Pulp and Paper Magazine, was held up before the Private Bills Committee of Parliament some weeks ago, because it was considered that the increased powers which the company sought might compete with the Ontario Hydro-Electric Commission in Eastern Ontario, was finally passed last week. An amendment wa sinserted, however, that the rates of the company for the surplus power which they ask permission to sell, must be subject to the control of the Hydro-Electric Commission, and the bill was also altered to more adequately safeguard the rights of Quebec municipalities.—''Mac.''

STRAWPULP PAYS NO DUTY

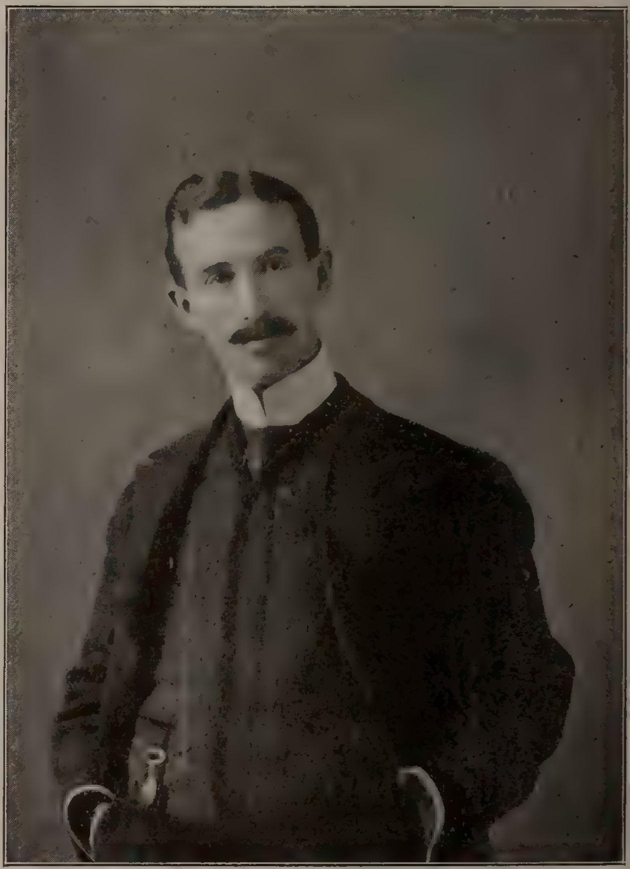
According to a recent ruling of the United States Treasury Department, strawpulp is admitted free of duty under the chemical wood-pulp provision. The ruling is given in the following letter to the Collector of Customs at New York:

''I have to acknowledge the receipt of your letter, transmitting a report from the appraiser and five letters from domestic paper manufacturers who are said to be users of strawpulp, from which it appears that, prior to October 3, 1913, strawpulp was regarded by paper manufacturers as a variety of chemical woodpulp.

In view of the foregoing, and as it appears that strawpulp is used for the identical purposes for which chemical woodpulp is used, you are hereby directed to pass merchandise of that character free of duty, under paragraph 649 of the present tariff act, which paragraph provides, in part, for the free entry of chemical woodpulp.''

John Martin---A Hustler

John Martin, head of the John Martin Paper Co., Limited, who recently returned from an extended business trip to all the Eastern paper centres in Canada and the United States, reports that, while trade is rather quiet in some lines, still on the whole the outlook is favorable. Mr. Martin looks for a return to former active conditions in the course of a few months at the very least. He visits all the leading paper plants at least twice a year and keeps closely in touch with manufacturing conditions, new lines, output, etc. It is not yet four years since he embarked in business for himself in Winnipeg, starting in a very small way. To-day the John Martin Paper Co. not only has large quarters in Winnipeg but has established healthy branches in Calgary and Edmonton, while the Saskatchewan territory is being developed through sample rooms in Regina.



A man of energy and optimism, Mr. Martin is not afraid to strike out on original lines, and one of the first moves on his part after establishing a warehouse in Edmonton was to entertain the members of the Printers' Board of Trade in that city to a banquet. He believes in the closest co-operation with the trade in all its branches. Another enterprise on his part is the publication of a house organ which deals with the problems of the printer from a wide point of view and in that way he is making the edition of interest to the Western typographical establishments. The name of the organ is ''Papyrus,'' and the firm also handles a special brand of paper known as Martin's Papyrus.

Mr. Martin may be well styled as a graduate of the University of ''Hard Knocks.'' His father dying when he was but two years old, left the family resources scanty, and, after a more or less varied experience, the son entered the employ of the Canadian Paper Co. at the age of seventy years. He spent two years in the manufacturing end of the business at Windsor Mills, Que., and then came to Montreal, where he joined the city selling staff of the company. He met with such success that he was soon made Eastern representative, covering the territory that extends from Eastrn Ontario to the Atlantic Coast. After serving nine years in that capacity he acquired an interest in the firm of McFarlane, Sons & Hodgson, Montreal, looking after their work in Quebec and the Maritime Provinces for seven years and being finally placed in charge of the Winnipeg branch. Some time later he launched out on his own behalf, and the expansion of the firm has been typical of Western growth and activity. His firm has such strong selling agencies as Ritchie & Ramsay, Toronto; J. R. Booth, Ottawa; St. Lawrence Paper Mills, and some of the best American lines.

Mr. Martin is well known and well thought of by all the members of the craft and is doing much to develop the paper trade on the Prairie Provinces. To build up the large wholesale paper connection which he has done in less than four years is, in the vernacular of the present day, "going some."

PAPER MANUFACTURING IN SOUTHERN BRAZIL

At the present time the manufacturing of paper has ceased in the State of Parana. Not quite a year ago there was a saw mill at Morretes, about 10 miles from Paranagua manufacturing wrapping paper from imported rags and wood pulp. This mill is situated right in the swamps at a point where the Hedychium coronarium, a plant of a ginger character, is abundant. The Hedychium coronarium reaches a height of from 3 to 6 feet, growing rather profusely, and produces from 100 to 150 stems per square meter. Many stems have a diameter of 1 to 2 inches at the root, and weigh including foliage about 400 to 600 grams. The Swedish Attache for Commerce in Brazil publishes the following two analysis made in England:—

	Whole of stem as plucked	Whole of stem having passed two crushing rolls
	Per cent.	Per cent.
Humidity	9.7	11.2
Ash	4.5	4.8
Cellulose	43.0	48.0
Yield of Cellulose through chemical extraction	42.8	36.0
	100.0	100.0

A Brazilian living at Curityba, holding the rights for manufacturing paper from Hedycium coronarium, made the following statement: There are 7,000 to 8,000 acres of Hedychium coronarium near Morretes, producing approximately 50,000 tons of dry fibre, which is sufficient for a yearly production of 30,000 tons of paper.

Early in 1914 the Anglo-Brazilian Pulp and Paper Mills Co. was founded in London with a capital of £240,000 to take over and enlarge the plant at Morretes for the purpose of manufacturing paper from Hedychium. However, after careful consideration of local conditions and the value of the plant for paper manufacturing the original interest shown in this enterprise has somewhat cooled off, this report coming from a reliable and well-informed source. It remains to be seen whether actual operation of the mill will be started.

All newspaper is being imported, printers buying direct from exporters in Hamburg and Paris without the medium of dealers at Curityba. Only small quantities are required, a thin and cheap paper being used. One newspaper buys Austrian paper through a Hamburg jobber, while others print on Swedish, Norwegian and German paper. The Sao Paulo paper mills find a good market in Parana for wrapping paper, which is being used by the Mate (tea) exporters ti line wooden barrels with. The usual terms in the paper business are 90 days sight or the acceptance of a draft payable from 3 to 6 months after receipt of goods at Paranagua.

PAPER MILLS IN ARGENTINA

On account of a rather high protective tariff (8c. per kilo on wrapping paper, 2c. per kilo on news, and 4c. per kilo on most of the other grades of cheap paper), Argentine paper manufacturers are in a position to make good profits.

There are 12 mills in the Argentine Republic, of which six are owned by foreigners. The total capital invested in the paper manufacturing industry is approximately $3,500,000.00 and the yearly output amounts to some $2,500,000.00. The figures for imports of raw material from abroad reached $500,000.00, of which pulp and kaolin represent the biggest share.

Approximately $150,000.00 of waste paper and rags were procured on their own markets. The amount of power employed in the industry is estimated at 4,733 h.p., divided as follows: 533 h.p. steam, 533 h.p. oil, 833 h.p. electricity. The number of mill employees is 1,405.

The most important of these enterprises are the following: "La Argentina," at Zarate. German capital, with head offices at Buenos Ayres. This mill makes chiefly wrapping papers in all shades, printing paper and cardboard, also low grades of S. C. book and litho. for the illustrated periodicals of Buenos Ayres. The daily production is about 20,000 kilos. The firm of Pablo Denti (Italian capital) owns two mills, one at Campana and another one at Vincent Lopez, turning out a cheap grade of printing paper. Daily production about 10,000 kilos.

SUMMER RATES ON LUMBER INCREASED

The objection made to the Railway Commission about three weeks ago by Frank Hawkins, secretary of the Canadian Lumberman's Association, acting in behalf of the lumbermen in Ottawa and district, against the proposal of the railways to increase the domestic summer rate on lumber betwen Ottawa and district points and Montreal from five to six cents, has been overruled by the board. This means that the increased tariff, filed to go into effect on May 4, and suspended by the board during the consideration of the application, will go into effect forthwith.

The board, however, has sustained the objection made by Mr. Hawkins against the proposed increase in the export rates on lumber from here to Montreal, from five to six cents. The judgment orders that the five-cent rate per 100-pounds, which went into effect in May, 1908, must be maintained.

In his judgment, Assistant Chief Commissioner D'Arcy Scott says that the railways have a right to ignore water competition if they desire to do so.

UNITED STATES NOTES

The White & Leonard Wholesale Paper Company, of St. Paul, Minn., has acquired 25,000 square feet of ground with Minnesota Transfer frontage. The deal was handled by the Vaughan Realty Company. The price was not disclosed. On the tract, which has a frontage of 150 feet on Pelham avenue, near University avenue, the concern will erect a five-storey reinforced concrete building to be used as a warehouse and genral office. The Minneapolis branch office and the St. Paul general offices will be located in the new structure.

Financial straits brought by inability to get sufficient working capital are explained by the Capac Paper Company of Capac, Mich., in a petition for a receivership filed in the United States Court. Arthur B. Curtis, of Capac, has been appointed by Judge C. W. Sessions, of Grand Rapids, as receiver for the company, under a bond of $75,000. According to the petition the company is only temporarily embarrassed. The claim is made that the company is solvent unless forced to liquidate on short notice, in which case its claim is that its expensive machinery, peat bogs, artificial basins and real estate would bring only a small amount of their value in connection with the business. The company is capitalized at $1,000,000.

On May 1 the firm of Cornell & Ward, New York manufacturers and dealers in paper, with a branch factory at Kaukauna, went out of existence, having sold all their interests to retire from business. The toilet paper business, including the factories at Kaukauna and Hinsdale, N. H., were taken over on that date by the Shute-Washburne Co., incorporated, with headquarters in New York the same as before. The corporators of the new company are men who have been with the firm of Cornell & Ward for years and who have been the managers and salesmen of the company, and continue in their respective positions with th new organization, the business in every way practically continuing as it was, only under a new name. Ross White will be the New York manager, B. B. Washburne, head salesman, Gustave F. Stohr, general office manager, and H. L. Scholl, manager of the Kaukauna plant.

Operations were started last week on the foundation of the new sulphite mill of the Penobscot Chemical Fibre Company at Great Works, Me. The mill has been planned for more than a year, but has been retarded through litigation. One hundred tons of sulphite pulp a day will be the ultimate production of the new plant, but the amount to be turned out at the completion of this portion will be about 50 tons a day. The present plant of the Penobscot Chemical Fibre Company turns out in the vicinity of 75 tons of soda ash pulp daily and the new plant will give a capacity of 125 tons of pulp of the two varieties a day.

The new superintendent who took charge of the Eureka Paper Company plant last week was James Salter, of Middleton, Ohio. Mr. Salter received his early training in England. Most of his work there was in connection with the manufacture of jute and manila papers. Later he had several years' experience with the E. B. Eddy Company at Hull, Canada. T. H. Webb, president of the Eureka Paper Company, considers himself fortunate in having secured the services of such a man, as his wide experience should make him a valuable acquisition. Mr. Shantly, who was formerly connected with this company, has secured a position with Robertson Brothers Company, of Hinsdale, N. H.

The John Orchard Mining & Investment Company, of Ketchikan, Alaska, is building a sawmill preparatory to the construction of a pulp mill of 50 tons daily capacity. Representatives of a Norwegian company have also been in Southern Alaska for the purpose of investigating possibilities for the erection of a large pulp mill. The concern has a $2,000,000 pulp mill in Norway. The location of the Orchard interests is in the heart of one of the greatest pulpwood districts in the world. The proposed source of power is a lake of an area of about 2,000 acres. There is an available drop of 130 feet close to the mill site.

The State of Maine now has what is belived to be the only paper mill in the United States making the India paper, which has of late been found useful in printing large encyclopædias, as it is a paper very fine in texture, very thin, very light and very strong. This paper has heretofore only been made in England. The S. D. Warren Paper Co. has recently installed a machine for making this paper in its mill at Gardiner, Me. On it is made a paper that has just twice as many sheets to the pound as the ordinary book paper. The installation of this and additional similar machines may mean the revival of the growing of flax in large quantities here in Maine, as the paper is made from flax fibres.

The cases of the State Department of Health against the Hammermill Paper Company of Erie, Pa., and the Watson Company, which were to have been tried during the past fortnight before Alderman Bassett, have been continued indefinitely. The companies were proceeded against for dumping refuse from their plants into the lake. The State Department has indicated that the continuance is merely a probationary period to give the defendants an opportunity to eliminate the pollution.

The Augusta Paper Company, of Augusta, Ga., was placed in voluntary bankruptcy last week, when United States Deputy Clerk C. J. Skinner, Jr., filed the papers, drawn up and signed by the president and general manager, H. W. Jernigan. The firm gave as their liabilities $7,366.09, and assets amounted to $3,977.19.

Ground will be broken at Syracuse, N. Y., for the New York State College of Forestry building this week, according to word received by Dean Hugh F. Baker from Gustave De Kimpe, of Hoboken, N. J., the contractor. Plans and specifications for each sub-contractor have been forwarded and will be turned over to the contractors in the next few days. In the basement of the building there will be two departures of unusual interest to visitors as well as being of great value in the carrying on of the work of training expert foresters. One of these is a complete paper plant, which will be located on the front of the building to the right of the central hall. In the back of the building, to the left of the central hall, there will be located a timber testing room.

The outlook for steady work and steady running at the mills of the Nashua River Paper Corporation is much more encouraging for the workmen, under the change of management, the former president, George T. Keyes, with Charles W. Keyes and Charles B. Taft, composing the new firm under the old name of the Nashua River Paper Co. Many changes are being made, however, and it is understood many of the employes have been discharged, and there is a general shifting of the office force. Emery J. Darling has resumed his former position as overseer of the repairs, and it is rumored that H. C. Thurston, who was for many years superintendent, is to return in the near future.

M. D. Brooks, of Erie, Pa., will become superintendent of the Gill division of the American Writing Paper Company at Holyoke, Mass., to succeed Andrew Miller, who has been transferred to the Albion division. He succeeds Henry Overman, who resigned a month ago. John Montgomery, superintendent of the Crocker division, has been appointed superintendent of the Albion division. Mr. Montgomery will supervise the work in both divisions, the American Writing Paper Company officials testifying in this manner to his efficiency.

In a conversation last week with Governor John Strange, of Neenan, Wis., the information was gained that he has purchased the buildings and grounds of Menasha Woolen Mills, and that he will in the near future begin the manufacture of the best pails and other packages ever put on the market. Mr. Strange controls the patents covering the new process paper pails, and says they ensure an article that will command swift sales wherever introduced. In point of fact the produce of the new factory will have capacity at once, and grow rapidly, and there is every reason to believe that a large plant will follow the small beginning within the coming decade.

It is good news for all the people of Massachusetts Farley in Erving that the receivership of the Farley Paper Company has been terminated and its property conveyed to Chandler M. Wood, of Boston. The money required to compromise with the creditors was secured through C. D. Parker, of Boston, and other underwriters. William A. Daverport, of Greenfield, had a principal part in securing the discharge. Business has been resumed, and apparently there will be prosperity for the community. George H. Munroe, of Orange, formerly one of the three directing the affairs of the Farley Paper Company, will have a part in the new management. Mr. Munroe is the son of a famous oldtime journalist in Boston. He was associated for many years with the late J. B. Farley and D. E. Farley.

The Maine Central Railroad is endeavoring to cooperate with the Maine Forestry Department in preventing forest fires by placing the Mudge Slater spark arrester on their locomotives in view of testing its efficiency in preventing the escape of live sparks from the engines. In these tests cheese cloth and cotton batting were placed along the road and it was found that the sparks did not come in contact with them. It is probable that the road this season will attach these arresters to all of the locomotives running through the wild land section of the state.

The Beaver Board Companies, with headquarters in Buffalo, has evolved a plan to cement the interests of the company and its co-workers in a way designed to work out to the mutual satisfaction of all concerned. Common stock is being issued to division chiefs, department managers, branch managers and superintendents who have been connected with the concern for two years or more. A basis of allotment has been evolved considered equitable to all, while payments are provided for at par, although the company shows annual earnings several times above par. Only a small payment is required, the balance to be paid out of the company's earnings. This system is said to be the best known in the way of avoiding labor difficulties, which are no small factor in a concern the size of the Beaver Board.

In order to increase the efficiency of the Oakland division of the American Writing Paper Company, at Manchester, Conn., the company will entirely rebuild the machine room this coming summer, and otherwise improve the equipment. The American Company is installing a new 750 horsepower steam engine in the Mt. Tom division in this city, to be used to provide power in the low water season. All the local mills of the company are running full time.

MANAGEMENT OF REMINGTON-MARTIN UNDECIDED

(Special to Pulp and Paper Magazine).

Watertown, N.Y., May 10, 1914.

Men at the head of the reorganization plan of the Remington-Martin Group of Paper Mills have made a formal tender of the management to Frank L. Moore, president of the Newton Falls Paper Company, and manager of the Cylinder Paper Company, and president of the Empire State Forests Products Association, and his decision is now being awaited. It is stated that the salary which the proposition carried was at least $15,000 a year and stipulation that Mr. Moore resign his present connections with the Newton Falls and Cylinder Paper Companies and devote his entire time and energies to the new organization.

It is understood that Mr. Moore has not given a final answer as to whether or not he will accept, but that he has taken the position that he does not care to sever managing. He has brought the Newton Falls Paper Company to a point where it is on a very substantial his connections with the two companies he is now managing. He has brought the Newton Falls Paper Company to a point where it is on a very substantial basis and has also met with success in his work in connection with the Cylinder Paper Company. It is stated that he has tld some of his friends that he is so closely allied with his companies that he does not feel that he can now relinquish his connections with them, but that he has told some of his friends that he is so closely be. It is also reported that in case Mr. Moore should accept the proposition to manage the Remington Interests htat he would have some important requirements to exact from the company along the lines of exact authority to act on important features that might arise from time to time.

N. B. PULP & PAPER CO. RE-ORGANIZE

We understand that arrangements are about completed for the thorough re-organization of the company, and that a complete new plant would be built and equipped, making it one of the most modern and up-to-date on the Continent. London and New York capitalists are behind the new proposition. The creditors of the company have been paid in full. Plans are about completed for the purchase of extensive timber limits in the vicinity of the plant. Mr. J. L. McNicol, the general manager, is at present in Toronto disposing of the stock of paper on hand at Millerton.

Toronto Paper Co. Annual

The annual meeting of the Toronto Paper Manufacturing Co. was held in Toronto this week. A. W. Briggs, who has been secretary of the company, was elected a director to fill the vacancy caused by the resignation of J. J. Sullivan, of Bangor, Me. This was the only change on the Board, which now consists of R. S. Waldie, T. H. Watson, William Briggs, R. A. Lyon, T. Albert Brown, W. J. Sheppard and A. W. Briggs. Mr. Waldie was re-elected president and T. H. Watson vice-president.

The annual report of the directors was submitted, which showed the net profits for the preceding seven months, ending March 31, 1914, of $75,692.80, as compared with net profits for the preceding seven months, ending March 31st, 1913, of $76,937.25. The decrease in earnings is accounted for, by President Waldie in his annual report, owing to the general trade depression which has been felt, not only in Canada but in the United States and Great Britain among the mills, and also owing to the fact that the plant had to contend with the handicap of running the mill during the period of alterations to the sulphite plant, the output of which has been increased by one hundred per cent. In the annual statement the Board adds: "Business conditions are still unsatisfactory, but we have the advantage of the money spent on improvements last year, which should help us out now. The plant is in first-class condition and it will be our object to so maintain it. In connection with improvements to plant, additional land was purchased at a cost of $1,648.62, and this amount was charged direct to capital account. The improvements proper cost $51,586.89, of which we have charged $9,199.84 to buildings' account and $35,457.05 to machinery account. The balance, amounting to $6,930.00, we have written off. We preferred to write this amount off rather than add it to capital account and then write it into depreciation reserve. On ordinary renewals, repairs and maintenance account we spent $19,261.95, which the business absorbed. In addition we have written off our yearly proportion of the organization account and, after paying bond interest, dividends, directors' fees, etc., we have carried forward a credit to profit and loss account amounting to $27,534.25. Last year's balance sheet showed the sum of $955.95 as insurance reserve. This represented insurance moneys returned to the company and was set aside for extending our sprinkler system in the mill and was so used."

The dividend, which was raised a year ago to an eight per cent. basis, was later reduced to a six per cent basis, which now prevails. Dealing with this matter the report says: "You are already well acquainted with the changes made during the pear in the dividends and in view of the statements presented herewith we feel that you will approve of our action in reducing the same."

The statement of resources and liabilities for the year ending March 31 is as follows:—

ASSETS.

Capital Assets.	1913.	1912.
Land	$822,106	$810,300
Machinery	422,343	386,886
Improvement	......	3,480
Current Assets.		
Material	129,760	90,910
Accounts Rec.	73,497	27,852
Bills Rec.	......	75,182
Unexpired Ins.	874	1,865
Rental in advance	606	......
Cash in Bank	......	45,432
Cash on hand	22	22
Organization Exp.	4,411	7,133
	$1,453,623	$1,449,066

LIABILITIES.

Capital Stock	$750,000	$750,000
Bonds	500,000	500,000
Current Liabilities.		
Bills Pay.	10,339	1,187
Accounts Pay	56,605	40,843
Insurance Res.	......	955
Depreciation	109,143	109,143
P. & L. Balance	27,534	46,937

PROFIT AND LOSS STATEMENT.

Balance in P. and L. Account, March 31, 1913		$46,937.25
By profits for the year	75,692.80	
Less Bond Interest Paid and Accrued	30,000.00	
		45,692.80
Less Dividends Nos. 3, 4, 5 and 6 Paid		$50,625.00
Less Directors' and Secretary's Fees		2,318.90
Less Written off Organization Expenses, &c.		5,221.90
Less Written off Improvement Account		6,930.00
Surplus		$27,534.25

WILL VISIT EUROPEAN CENTRES.

Olivier Rolland of the Rolland Paper Co., St. Jerome, Que., leaves on the 23rd from New York on a two months' trip to France and Germany. While away Mr. Rolland will visit several of the large paper concerns in France and Germany, the Grenoble Technical School, the Leipsig Exhibition of Allied Paper Trades and the manufacturing plants of various supply firms in those countries. Mr. Rolland will favor the readers of the Pulp and Paper Magazine with several articles describing incidents of his trip and some of the places he will visit.

SLITTING AND RE-WINDING MACHINES

We have just received the catalogue of the American Machine Company of Brooklyn, New York, describing their paper roll cutting, slitting and re-winding machines. The subject of slitting and re-winding, which has been considered one of the simplest processes in paper manufacture, is analyzed from all sides and some very interesting facts are dealt with and analyzed. The illustrations and description of the American machines are very valuable, the various points of the machines being shown to good advantage. The illustrations show every feature of the machine as well as the methods used and the directions for setting up and operating the machines. The catalogue may be obtained on request to the company.

PULP AND PAPER NEWS

The Dunlop Pulp and Paper Co. of Selkirk, Man., has been granted a Provincial charter. The capitalization is 1,000,000.

The Laurentide Company has just closed two big paper contracts, one being for export of newsprint to Australia and the other to Texas. The new contracts, it is understood, are for delivery late in the year, as some time ago it was announced that the Laurentide output for 1914 had been practically sold in advance.

The issue in London of £246,550 in 6 per cent first mortgage guaranteed sinking fund fifteen-year sterling bonds of the Chicoutimi Freehold Estates Company, Limited, at 93 is announced. The company has acquired 400,000 acres of land from the Peribonka to the Manouan River, Quebec, which will be leased to the Chicoutimi Pulp Company.

D. J. Bennett has entered action at Osgoode Hall, Toronto, for a declaration that the Royal Bank of Canada holds as trustee for him a timber license covering forty-two miles in the Parry Sound district. An injunction to restrain the Long Lake Lumber Co. from cutting on this area is also asked.

Authority has been granted by the legislature to the Bathurst Lumber Company to build a dam on the Nepisiguit River, where it is proposed to put up a pulp and paper plant that it is estimated will cost $3,000,000. The agreement with the provincial legislature, however, stipulates that the company is to pay the government two dollars per horse-power a year for any power sold and not used in the paper plant.

Notices have been sent advising that the Abitibi Pulp and Paper Co is going into voluntary liquidation, but this is simply a winding up of the affairs of this company, which has transferred all its assets to a new company colled the Abitibi Power and Paper Co. This new company is continuing the construction of a paper mill, which it is expected will be in operation by July, 1915.

A. Barnet & Company Limited, Renfrew, Ont., have been granted a Federal Charter, which includes very wide powers, including the right to manufacture, produce, import, buy, sell and otherwise deal in pulp, mechanical and ground wood pulp, sulphite and pulp paper, etc. The incorporators are Alexander Barnet, James Barnet, T. F. Barnet and J. G. Barnet of Renfrew, and J. C. Browne, of Ottawa. The capital stock is $250,000.

The Federal Paper Company, Limited, of Montreal, are recently incorporated with a capital stock of $100,000, to manufacture, buy, sell and deal in pulp, pulpwood, paper and kindred materials and to carry on the business of a paper mill and dealer in all its accessories.

The news machine being built by the J. H. Horne & Sons Co., of Lawrence, Mass., for the Brompton Pulp and Paper Co. will be especially constructed to make a continuous sheet at the rate of 700 ft. per minute. It will have wire 160 inches wide and will produce a trimmed finished roll of paper 150 inches to 152 inches wide, ready for the printing press.

The William Beatty Lands and Timber Co., Ltd., of Parry Sound, Ont., has been recently incorporated with a capital of $100,000.

The Box factory of the Turner Lumber and Pulp Co., at Limoilou, Que., was destroyed by fifire on May 3. Arrangements have been made whereby the box business will be carried on until the factory is rebuilt. The loss is estimated at $20,000.

In reference to the flax decorticating concerns which have been established in Western Canada, James A. Brook has written to Hon. W. T. White, Minister of Finance, Ottawa, that the federal government is merely asked to offer encouragement to induce the development of an efficient machine and the institution of that business, and is not petitioned to ~~pay one~~ cent until a commercial spinnable fibre has been actually produced. Mr. Brook points out that if efficient decorticators were in successful commercial operation to-day there would be no necessity or justification for government aid, and that, if western interests have failed after expending over a quarter million dollars to develop an effective decorticator, it is obvious that there is greater need and the greater justification for government assistance in this matter.

Work is progressing admirably in installing the equipment of the new ground wood mill of the Abitibi Pulp and Paper Co., at Iroquois Falls, Ont., and it is expected by Superintendent Whyte that the plant will be in operation next month. A large proportion of the output of ground wood pulp has already been contracted for. Construction on the 225 ton paper mill has also been started and this branch of the great undertakings of the company it is hoped, will be running in a year from this month.

The bill to prohibit corporations, license holders and public contractors from making political contributions to campaign funds has been passed by the Ontario Government.

W. D. Gillean of Montreal, who represents several firms in the matter of paper mill supplies, felts, etc., has gone on a business trip to the Old Country.

It is understood that the Department of Lands, Forests and Mines of Ontario, is receiving a large number of inquiries, both from Canadian and foreign capitalists in reference to the area on the Frederickhouse and Abitibi rivers, for the right to cut pulp wood on which tenders are being asked and will be received up to June 8th. The usual stipulations are made in connection with the bids for the limits and the successful tenderer will be required to erect a pulp and paper mill to convert the pulp wood into the finished products.

The Ontario Railway Board had brought before it a few days ago two points concerning Fort Frances, both of which it decided to hold over until June 16, when the Board will make an investigation at the place mentioned. One matter related to the assessment of the Ontario and Minnesota Power Co. for $600,000, it being claimed on behalf of the company, that the amount was excessive. Counsel for Fort Frances took the attitude that the rate was reasonable and that the appeal was not warranted. The other matter was a request from the town that permission be granted to extend the municipal boundaries to the international line which annexation would mean the absorption of McAlpine township.

A decision of importance to the extensive power propositions on both sides of the St. Mary's River at Sault Ste. Marie has been reached by the International Joint Commission. The joint application of the Michigan Northern Power Co. of Sault Ste. Marie, Mich., and the Algoma Steel Corporation of Sault Ste. Marie, Ont., to erect compensating works at a point in the St. Mary's river between the two cities was approved, upon certain conditions with respect to the construction of the works, which have been recommended by the Government Engineers of the United States and Canada, and also upon other conditions governing the works after their construction. The formal reply of the Commission to the applicants will be made at the next meeting to be held in New York on May 25 at which time there will also be taken up the question of the water pollution in the St. Mary's river.

H. B. Hart, manager of the British American Wax Paper Co., Toronto, has returned from an extended trip to England. He reports the demand for wax paper for wrapping bread is constantly increasing and that a number of Canadian towns either have passed ordinances requiring all bread to be wrapped or are considering such a step. The Holden-Morgan Co., Toronto, which some months ago placed on the market a bread wrapping machine, have sold six of them to the Canada Bread Co., for their plants in Winnipeg, Montreal and Toronto, where they are now in successful operation. Several other Canadian bakeries are also wrapping a portion of their output. The Holden-Morgan Co. have just invented a semi-automatic wrapper for use in the smaller plants. The loaf is wrapped by hand, but the machine makes the bottom and end folds, the end folds being fastened by stickers.

J. L. Englehart, of Toronto, Chairman of the Timiskaming and Northern Ontario Railway Commission, who recently returned from a tour of inspection of the road, is full of enthusiasm over the north country and the development which is in progress. He says it is hard to realize that the settlers are doing so well, and reports that the operation of the Abitibi Pulp and Paper Co. at Iroquois Falls, who are spending four million dollars in the construction of pulp and paper mills, will do a great deal in providing a home market for the residents up north in the matter of pulp wood. Mr. Englehart added that there will be taken out this year ten thousand telegraph poles, three hundred thousand railway ties and fifty thousand cords of pulpwood which means that all this money will come right back into the hands of the settlers. They will get about thirty-three thousand dollars for the poles and a quarter of a million for the pulp wood.

The Lincoln Paper Mills, of Merritton, Ont., are now turning out a striped sulphite paper in several colors for the use of druggists, men's furnishers, stationers and other special lines of trade which is taking very well.

The British Columbia Sulphite and Fibre Co., who own a pulp mill on Howe Island, B.C., recently bought from the Provincial Government about eleven hundred acres of timber on the Cutlej Channel and will undertake to have the area cleared in three years. The holdings comprise six million feet of hemlock, three million feet of cedar and two million feet of larch. The hemlock and larch brought ten cents a thousand in addition to the royalty and the cedar twenty-five cents a thousand. For nine hundred and fifty acres on Broughton Island, which were also bought by the British Columbia Sulphite and Fibre Co., fifteen cents were paid for the hemlock and birch and forty cents for the cedar in addition to the royalty. The timber limits contents of the latter are nine million feet of hemlock, four million feet of larch and one and half million feet of cedar.

The soda pulp output of the Barber mill at Georgetown, Ont., has been increased one third recently by the addition of new cookers. In accordance with the policy of the St. Lawrence Paper Mills Co. to have the surroundings of all their mills attractive and inviting, flowers and shrubs have been planted during the past few days, lawns sodded and other improvements made which make beauty spots of the grounds.

James Chambers, of Chambers, Limited, Toronto, is removing his office from 152 Bay Street to the Bell Telephone Building on Adelaide Street West. W J. Trimble, general contractor, who has done much work for paper mills, will also have an office in the same building. Mr. Chambers has branched out in the manufacturing line and has started a machine shop at 80 Don Esplanade where parts and repairs for paper machine, road machinery, etc., will be made.

The water in the old Welland canal, from which many pulp and paper concerns derive power will be shut off for a week or ten days, starting on May 23, at the request of the industries. Several of the plants along the route will take occasion to do some overhauling, while weirs, water wheels, etc., will be given their annual cleaning out. The Kinleith Paper Mills at St. Catharines, will have new re-inforced concrete floors laid in their beater room and in the flat above, the Albertson Engineering Co. of Toronto, having charge of the plans. New beater tubs will also be installed by the Waterous Engine Works Co. The Montrose Division of the St. Lawrence Paper Mills at Thorold will also have a concrete floor laid in part of the old mill.

It is understood that the suit, which was brought against F. H. Anson and Shirley Ogilvie of the Abitibi Pulp and Paper Co., by John A. McAndrew of Toronto, former secretary of the company, for an account of profits due under an agreement of commission on sale of stock and interest on certain amounts has been settled.

Mr. Davis of Kilmer, Irving and Davis, barristers, Toronto, acting on behalf of the Abitibi Power and Paper Co., Limited, Toronto, has been busy adjusting claims for drowned lands on the Abitibi and Black Rivers in connection with the construction of the dam of the company at Iroquois Falls which resulted in flooding some three thousand acres belonging to the settlers. All the claims have been satisfactorily settled. Certain lands on the shores of Lake Abitibi which belonged to the provincial government and were flooded, have also been adjusted so far as any claims are concerned.

W. H. Rowley and George H. Millen, of the E. B. Eddy Co., Hull, were on a visit to the Toronto, London, and other branches of the company last week. Mr. Rowley, who had been in rather poor health all winter, has completely recovered as a result of his sojourn in the south.

The new plant of the Dominion Pulp Co. at Chatham, N.B., was put into operation last week. A complete new plant has been installed for the manufacturer of easy sulphite pulp, the capacity being 50 tons per day. Large limits have recently been purchased.

The Markets

CANADIAN MARKETS

The market conditions show improvement in some lines with the advent of warm weather, although matters have a long way to go before the buoyancy of a year ago will be felt. In news print business, the tide appears to have turned and some favorable foreign contracts have been made by leading mills. Prices are a little firmer, and, while some of the plants are not rushed, the majority are working on orders which will keep them going well until the end of the year. One large company reports during the past week as having concluded negotiations for heavy shipments to Australia and to Texas.

The war scare in Mexico has had the effect of many dailies across the line using more print paper by reason of enlarged number of pages and extra editions. In book and writing line the conditions remain about the same. Printing trade has been rather quiet for some time and mail order and catalogue houses report that business has fallen off, which means less printing and paper from large establishments. In ground wood, most of the mills are running on contract, and, while there are some inquiries, still buyers are hanging out for lower prices than several plants are willing to accept. Sulphite figures are well maintained and stocks are low. Paper jobbers report business during the month as only fair and orders for the most part small. The quietness of the shoe and other trades in the manufacturing line has had the effect of curtailing the output of paper box plants which make cartons. Wrapping papers are exceeding dull and price cutting still goes on in order to secure what business is going.

A leading paper house stated this week that banks, insurance corporations, security companies and other financial institutions, which had bought the very best bond and ledger papers in the past, were conservative in the matter of orders and were taking cheaper grades in many instances to meet their immediate demands.

The rag and paper stock market is only marking time and no heavy trading is done in any lines beyond the hand-to-mouth supplies. Roofing stock is a little stronger. All paper concerns are, however, confident that the present quiet condition of affairs will revive in all lines. It may take a few months to go, but there are undercurrents such as the organization of many new concerns, which show that capitalists are getting ready to go ahead with several projects just as soon as the monetary situation warrants a renewal of confidence.

The following prices prevail, f.o.b., Toronto

News rolls), $1.95 to $2 at mill, in carload lots.
News (sheet), $2.10 to $2.20 at mill in carload lots.
News (sheet), $2.25 to $2.50, depending on quality.
Book papers (carload), No. 3, 3.75c to 4.25c.
Book papers (ton lots), No. 3, 4c to 5.50c.
Book papers (carload), No. 2, 4.25c.
Book papers (ton lots), No. 2, 4.50c to 5.25c.
Book papers (carload), $4.75 to $5.25.
Book papers (ton lots), No. 1, 5.25c to 6.00c.
Writings, 5c to 7½c.
Sulphite bond, 6½c to 7½c.
Grey Browns, $2.00 to $2.75.
Fibre, $2.75 to $3.50.
Manila, B., $2.50 to $3.25.
Manila, No. 2, $2.85 to $3.50.
Manila, No. 1, $3.25 to $4.00.
Unglazed Kraft, $3.75 to $4.50.
Glazed Kraft, $3.90 to $4.75.

Pulp.

Ground wood (at mill), $15 to $15.50.
Ground Wood, $21 to $23, delivered in United States.
Sulphite (unbleached), $41 to $43, delivered in Canada.
Sulphite (unbleached), $42 to $44, delivered in United States.
Sulphite (bleached), $55 to $57, delivered in Canada.
Sulphite (bleached), $56 to $58, delivered in United States.

Paper Stock.

No. 1 hard shavings, $1.87½ to $1.90, f.o.b., Toronto.
No. 1 soft white shavings, $1.75.
No. 1 mixed shavings, 50c.
White blanks, 87½c to 90c.
Heavy ledger stock, $1.40 to $1.50.
Ordinary ledger stock, $1.15.
No. 2 book stock, 45c to 50c.
No. 1 book stock, 70c to 75c.
No. 1 Manilla envelope cuttings, $1.10 to $1.15.
No. 1 print Manillas, 60c.
Folded news, 45c.
Over issues, 50c.
No. 1 clean mixed paper, 25c to 27½c.
Old white cotton, $2.50 to $2.75.
Thirds and blues, $1.30 to $1.32½.
No. 1 white skirt cuttings,, $5.00.
Black overall cuttings, $1.75.
Black linings, $1.75.
New light flannelettes, $4.75.
Ordinary satinets, 75c to 80c.
Flock, 90c.
Tailor Rags, 70c. to 75c.

Quotations f.o.b. Montreal are:—

Book and News Paper.

Roll News, $40 to $43 per ton for large orders; $45 to $50 per ton for small orders.
Ream News, $45 to $47 per ton for large orders; $50 to $60 per ton for small orders.
No. 1 Book, 5¼c to 6c per lb.
No. 2 Book, S.C., $4.50 to $4.75 in large quantities; $4.75 to $5.50 in small quantities.
No. 3 Book, M.F., $4.00 to $4.25 in large quantities; $4.40 to $4.50 in small quantities.
Writings, 5c to 7½c.
Sulphite Bond, 6½c to 8½c.

Wrappings.

Grey Brown, per 100 lbs., car lots, $2.25 net; 5 tons $2.45; 2 tons, $2.55; 1 ton, $2.65; less, $2.75.
Red Brown, car lots, $2.85; 5 tons, $2.95; 2 tons, $3.05; 1 ton, 3.15; less, $3.25.
B. Manilla, car lots, $2.85; 5 tons, $2.95; 2 tons, $3.05; 1 ton, $3.15; less, $3.25.
No. 2 Manilla, car lots, 3.10; 5 tons, $3.20; 2 tons, $3.30; 1 ton, $3.40; less, $3.50.
No. 1 Manilla, car lots, $3.25; 5 tons, $3.45; 2 tons, $3.55; 1 ton, $3.65; less $3.75.
Kraft, $3.75 to $5.00.
Fibre, car lots, $3.25; 5 tons, $3.45; 2 tons, $3.55; 1 ton $3.65; less $3.75.

Fibre, $2.75 to $3.50.
Manila, B., $2.50 to $3.25.

Most of the manufacturers are quoting 10 per cent. less than the above prices to the jobbing trade on the cheaper lines of wrapping, such as B. Man., No. 2 Man.—grey and red browns.

Pulp.

Sulphite easy bleaching, $43 to $45 per ton.
News quality, $41 to $42 per ton.
Bleached sulphite, $54 to $59 per ton.
Kraft pulp, $3.60 to $4.00.
Ground woods, No. 1, $15 to $16.
Ground wood, No. 2, $22 to $24, delivered United States.

NEW YORK MARKETS

Office Pulp and Paper Magazine,
206 Broadway, New York.

There has been no marked change in the general conditions governing the local market for ground wood pulp. The tone is healthy and the feeling among dealers is that the year will be a good one. Spot orders are rather sparse, but good prices are obtained for such orders. No deals have been closed in the local market for strictly No. 1 ground wood pulp at less than $21.50 a ton delivered. Plentiful water supplies have enabled grinders to make good sized stocks of pulp, much of which is already contracted for, with future deliveries. Some manufacturers have already contracted for the current year's capacity and in one instance, for more than that. Contracts are not closed in the local market at less than $16.50 at the mill and in the interval some grinders held out for a still better price. This is due to the heavy consumption of newsprint during the war scare period, when metropolitan dailies exceeded their normal consumption, on an average, by about 40 per cent. Delivered values for No. 1 pulp are quoted in the local market at $20.50 to $24 a ton.

Old waste papers have been the really active market for paper stock. Although board mills are not as active as they have been, there is still a fair demand for the lower grades. Old newspapers, strictly overissue, are commanding 67½c. a hundred pounds, and strictly folded are quoted at 50c. a hundred pounds. The continued activity at book paper mills has had a steady good influence on the higher grades. Flat stock of all description is moving in good way at prevailing values, which are firm. White shavings are in good demand and the current values of $2.40 a hundred pounds for hard shavings is firm. Soft shavings are not very plentiful and they are commanding about $2.12 a hundred weight.

Pulp.

Ground Wood, No. 1, $20.50 to $24, delivered.
Ground Wood, No. 1, $20 to $24, delivered.,
Ground Wood, No. 2, $15 to $17, delivered.
Uubleached sulphite, dom., 1.90c to 2.20c delivered.
Unbleached sulphite, imptd., 1¾c. to 2c. ex dock, New York.
Bleached sulphite, domestic, 2.80c. to 3c. delivered.
Bleached sulphite, imptd., 2.60 to 2.90 ex dock, N.Y.
Easy Bleaching, impt., 2c to 2.20c. ex dock, N.Y.
Unbleached sulphite, impt., 1.75c to 2.10c., ex dock, N.Y.
Bleached sulphite, impt., 2.60c. to 2.80c., ex dock, New York.
Kraft pulp, impt., 1.80c to 1.90c., ex dock, N.Y.
Soda pulp, domestic, 2.10c. to 2.15c., delivered.

Paper

There is a quiet but healthy tone to the local paper market in general. There is practically no big business going on in any grade except news, which has been in very active demand since the sensational execution of several convicts a few months ago, when heavy editions and extras were printed by the metropolitan dailies. Other grades are in quiet demand and orders are in nearly all cases for actual and immediate use. Such orders necessitate a good deal of bookkeeping, but in the end have proved very profitable, especially in the jobbing trade. Jobbers, however, are running in low stocks and have cut well into their reserve supplies. When they place orders with mills it is generally desired that prompt delivery be made, which is a good sign that the order is for only a small job lot that was asked for by a consumer.

There is a good deal of disgust and indifference reflected in the talk of the trade concerning business. The general quietness that has existed for about three months has caused the trade to take a peculiarly lassitudinous attitude toward business. The past week has brought about a little better feeling, particularly among manufacturers who realize that the jobber is not carrying any reserve stock. Consumption has continued just the same, although consumers are not buying ahead or carrying any reserves. They have cut down the retailers' and jobbers' stocks to such an extent that it will not be long before a steady, growing demand will begin. There were many extras and heavy editions printed by metropolitan newspaper publishers during the threatened war with Mexico. Heavy editions still continue and the consumption of news has increased in the interval about 40 per cent. There has been no change in price, but if the present rate of consumption continues there will be an advance. Sheet news is very firm at prevailing figures, which are 2.25c. to 2.30c., delivered. Side runs are plentiful and values are low. Some mills have closed deals for counter rolls as low as 1.80c. at the mill. Even the larger sizes are not commanding more than 2c., delivered. The manila and fibre market has been rather quiet from the manufacturing point of view, but small orders among jobbers have totalled in many cases a larger tonnage than the same period last year. Values in all grades are firm. There is a little brisker demand for the lower grades. Book papers are firm at prevailing quotations, which are likely to be advanced in the near future. There has been a little improvemen in deliveries by manufacturers. Specialty papers are in active demand all over, although there has been some easing in the demand for cover paper. This is attributed to the falling off in the number of special issues among periodical publishers, most of whom have already turned out their spring numbers. Toilet papers and paper towels are in fairly good demand. Cigarette papers continue to move actively at prevailing prices, which are fairly high. There is only a poor demand for paper bags, but there is very little price cutting. Coated papers are in softer tone, but values are well maintained. The tissue market has been very quiet. Prices are low and the demand is poor. Certain local jobbers have attempted to bear the market by reports that they had purchased 1,000 ream lots of No. 1 white tissue at 38c. No manufacturer could afford to sell as low as that was, the opinion of the local agents and manufacturers. Manila tissues are unchanged in value. Kraft tissue has been fairly active at 47½c. to 50c. Bonds, writings and ledgers are in fair demand.

There seems to be no new business in this field, as one manufacturer reports good business and another poor. The situation seems to be that they are taking business from each other, but not creating any new field of consumption. As the spring demand for boxes has eased, there has been a slackening in the demand for boards of all grades. There has been no change in prices, however.

News, rolls, transient business, $1.95 to $2.05 f.o.b.
News, rolls, contract renewals, $1.95 to $2.00 f.o.b.
News, side runs, $2 to $2.10 f.o.b. mill.
News, sheet, $2.25 to $2.30 f.o.b. mill.
Book papers, car lots, M.F.S., $3.75 to $3.90 f.o.b.
Writing paper superfine, 13½c to 17c, del. east of Miss. River.
Writing paper, extra fine, 11c, del. east of the Miss. River.
Writing paper, No. 1, fine, 9c, del. east of the Miss. River.
Writing paper, No. 2, fine, 8c, del. east of the Miss. River.
Writing paper, engine sized, 4½c to 8c, del. east of the Miss. River.
Bond paper, 5c to 24c, delivered east of Mississippi River.
Ledger paper, 8c to 30c, delivered east of Mississippi River.
Linen paper, 7c to 18c, delivered east of Mississippi River.
Manila jute, 4¾c to 5¼c, delivered.
Manila, wood, $2.40 to $3.00, delivered.
Kraft, No. 1, $3.50 to $3.75 f.o.b. mill.
Kraft, No. 2, $3.25 to $3.50, f.o.b. mill.
Boxboards, news, $30 to $33 per ton, delivered.
Boxboards, chip, $28 to $31 per ton, delivered.
Boxboards, straw, $28 to $31 per ton, delivered.
Wood pulp board, $42.50 to $45 per ton, delivered.
Tissue, white, cylinder, 40c to 42½c, delivered.
Tissue, fourdrinrie, 47½c to 50c, delivered.
Tissue, jute Manila, 40c to 42½c, delivered.

THE BRITISH MARKETS

(Special to Pulp and Paper Magazine).

The outlook in the British paper industry is more hopeful now than has been the case for some months past. Still, it must be admitted, the volume of business passing on home and export account is not what manufacturers would like it to be, and those engaged in the allied trades, such as chemical, fillings, and pulp report that the orders received from paper mills are considerably below those placed during this time last year. Newsprint and kraft have been mostly affected since the beginning of the year, but now business in these branches of the industry has somewhat revived and there are signs of a good undertone. The demand for fine printing papers and fine writings is fair, while the export trade shows improvement. Cheap printing paper has recently found a good consuming channel, and the same may be said in regard to cardboard and wood pulp boards. There is a good call for wrappings of a cheaper kind, and in this respect the foreign imports are finding a good outlet. Manufacturers of esparto papers are experiencing a crucial time owing to the high cost of the raw material and the difficulty in laying in substantial stocks. Whenever possible an effort is made to increase prices, but this is always a difficult problem to solve with clients. Prices of esparto are inclined to go higher and it is feared the finished product must move likewise all round. On the whole the British paper market shows a more promising outlook.

The market for sulphite is still dull and the amount of business passing is very small. Sulphite has been more enquired for and a few prompt orders have been given out by mills. From Scandinavia and Germany reports reach London that business in chemical pulps is very slow. Prices are about as follows:—

Sulphite Bleached (No. 1)	$56.40	to	$62.00
Sulphite Easy Bleaching (No. 1)	37.20	to	39.60
Sulphite News	38.20	to	39.20
Soda Unbleached (No. 1)	34.80	to	36.40
Soda Kraft	38.00	to	38.50

All prices are c.i.f. British ports.

The mechanical pulp market shows no improvement and mills are doing practically no business with importers. Deliveries on contract are arriving in fair quantities. Norwegians report numerous enquiries and that prices are inclined to be hardened. The German and Swedish reports are to the effect that the markets are featureless. Prices are about as follows:—

Pine, 50 per cent. moist (unwrapped)	$10.00	to	$10.70
Pine, dry	22.40	to	30.20

All prices c.i.f. British ports.

Straw pulp manufacturers on the continent are sold well ahead for some months and prices are very firm. Esparto is becoming dearer and the market is quiet with little enquiry and no pressure to sell. Trade in rags of all descriptions is good, but supplies are somewhat short and prices are consequently very firm.

The chemical trade is fairly active. Caustic Soda has slightly advanced and for 76-77 per cent. the price quoted is $48.50 per ton. Bleaching Powder is $26; Soda Crystals, $11.60 and Salt Cake, $9.90 per ton, delivered. Ammonia Alkali is unchanged at $16.40. Sulphur is scarce and firm for some weeks past. China clay manufacturers are now being approached with a view to settling up 1915 contracts and there are no signs of prices easing. Prices of other fillings, such as gypsum, mineral white, etc., are unchanged, but makers report a falling off in the orders from paper mills compared with this time last year.

DEATH OF JAMES REID WILSON IN LONDON

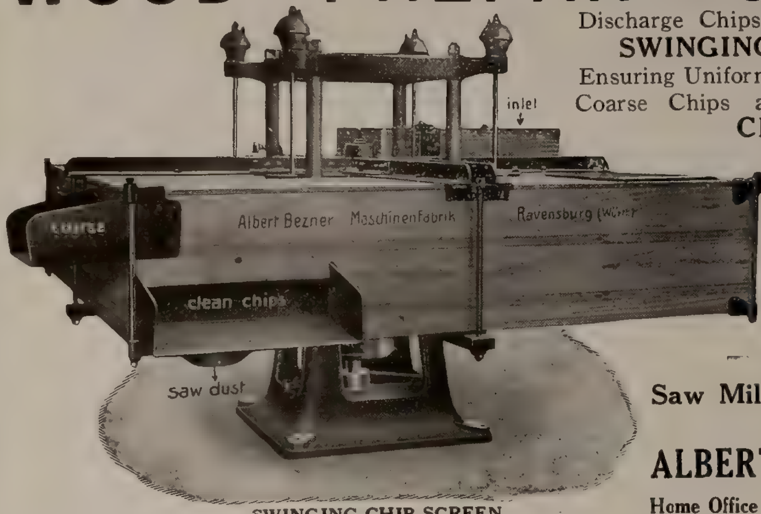
The announcement of the death of Mr. James Reid Wilson in London, Eng., on May 11 last, was a shock to his many friends in commercial and financial circles in this country. Mr. Wilson had been ailing for some time. His death was caused by pneumonia.

The late Mr. Wilson was one of the most prominent men in the Dominion, and for many years one of Montreal's leading citizens. He was connected with Messrs. Thomas Robertson & Co. since 1871, having been made president of the company in 1876, which position he held up till his death. Besides his interests in many other companies throughout the Dominion, he took a deep interest in the paper industry and was a director of the Wayagamack Pulp and Paper Co., holding a considerable interest in the company.

W. A. Newton, Toronto, Canadian manager of the Albertson Engineering Co., of Kalamazoo, Mich., has secured a patent on a new beater and washing engine, which it is reported effects a great saving in power, and posses many other advantages. The beater is of the revolving type.

The management of the Nicolet Falls Pulp and Lumber Company, at Nicolet Falls, Que., expect to commence operations for this season next week, the drive of logs being about all down.

WOOD PREPARING MACHINERY



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TENDERS FOR WOOD LIMIT.

TENDERS will be received by the undersigned up to and including Monday the 8th day of June, 1914, for the right to cut wood of various descriptions on a certain area tributary to the Frederickhouse and Abitibi Rivers in the District of Temiskaming.

Tenderers shall state the amount they are prepared to pay as bonus in addition to the ordinary Crown dues, including 40c per cord for Spruce and 20c per cord for other pulpwoods, or such other rates as may from time to time be fixed by the Lieutenant-Governor in Council for the right to operate wood products mills on or near the area referred to.

Such tenderers shall be required to erect a mill or mills on or near the territory, and to manufacture the wood into products thereof in the Province of Ontario.

Parties making tender will be required to deposit with their tender a marked cheque payable to the Honourable the Treasurer of the Province of Ontario for ten per cent. of the amount of their tender, to be forfeited in the event of their not entering into an agreement to carry out the conditions, etc.

The highest or any tender not necessarily accepted.

For particulars as to description of territory, capital to be invested, etc., apply to the undersigned.

W. H. HEARST,
Minster of Lands, Forests and Mines.
Toronto, Ontario, 24th April, 1914.

TENDERS FOR ALLAN WATER RIVER WOOD LIMIT.

TENDERS will be received by the undersigned up to and including Wednesday, the 15th of July next for the right to cut ties from Spruce, Balsam, Banksian or Jack Pine, Poplar and Whitewood trees seven inches and upward in diameter two feet from the ground sufficient to supply a tie preserving plant for a period of twenty-one years from unoccupied, unsold and unlocated lands of the Crown tributary to what is known as the Allan Water River, tributary to the Grand Trunk Pacific Railway in the District of Thunder Bay.

Tenders shall state the amount they are prepared to pay as bonus in addition to the crown dues of $2 per thousand feet board measure for anything not manufactured into ties, and for ties at the rate of 5c each, or such other rates as may from time to time be fixed by the Lieutenant-Governor in Council.

Such tenderers shall be required to erect within the limits of the territory covered by the right to cut ties, or at some other place approved by the Lieutenant-Governor in Council a tie preserving plant.

Parties making tender will be required to deposit with their tender a marked cheque payable to the Honourable the Treasurer of the Province of Ontario for $25,000.00, to remain on deposit as security for the carrying out of the conditions of their tender.

The highest or any tender not necessarily accepted.

For particulars as to description of territory, capital to be invested, etc., apply to the undersigned.

W. H. HEARST,
Minister of Lands, Forests and Mines.
Toronto, Ontario, 27th April, 1914.

SALE OF PINE TIMBER ON METAGAMI INDIAN RESERVE.

TENDERS will be received by the undersigned up to and including the 6th July next for the right to cut the Red, White and Jackpine timber over eight inches in diameter on the Metagami Indian Reserve, situate on the Metagami River in the District of Sudbury.

For particulars, descriptions, conditions, etc., apply to the undersigned.

W. H. HEARST,
Minister of Lands, Forests and Mines.
Department of Lands, Forests and Mines,
Toronto, 2nd May, 1914.

No unauthorized publication of this notice will be paid for.

TIMBER SALE.

TENDERS will be received by the undersigned up to noon of the 15th day of July, 1914, for the right to cut the Red and White Pine timber on berths 1, 2 and 3, Township of Blyth, in the District of Nipissing.

For maps and conditions of sale apply to the undersigned, or the Crown Timber Agents at Sudbury and North Bay.

W. H. HEARST,
Minister of Lands, Forests and Mines.
Toronto, May 4th, 1914.

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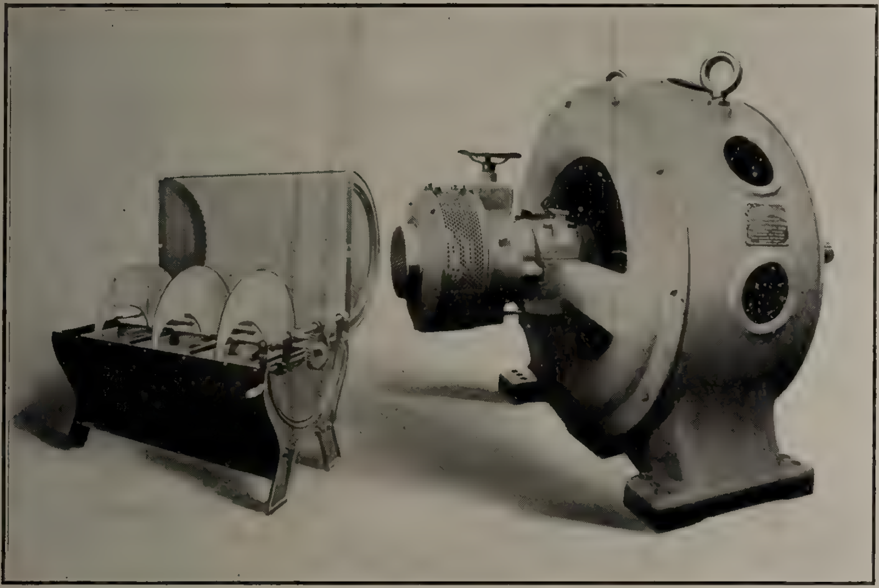

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We shall be glad to quote you on your requirements for all kinds of electrical apparatus.

AUCTION SALE OF TIMBER LIMITS

Re:- H. M. PRICE & CO.

Lumber Merchants, Quebec, Insolvent.

PUBLIC NOTICE is hereby given that on WEDNESDAY, August 5th, 1914, at 10 o'clock A.M., the Timber Limits hereinafter mentioned will be offered for sale by Auction without reserve, at the office of Messrs. LaRue & Trudel, Accountants, Dominion Building, 126 St. Peter Street, Quebec:—

				Sq. Miles.
License	No.	181	River St. Jean Br. East No. 1	22
"	"	182	River St. Jean N.E. Branch No. 2	18
"	"	183	River St. Jean East Branch No. 3	20
"	"	184	River St. Jean, No. 7	12
"	"	185	River St. Jean; No. 8	12
"	"	186	River Saumon & Tribut River St. Jean	34
"	"	187	River Magpie, No. 3	32
"	"	188	River Magpie, No. 4	32
"	"	189	River Magpie, No. 5	32
"	"	190	River Magpie, No. 6	32
"	"	191	River Magpie, No. 7	32
"	"	192	River Magpie, No. 8	32
"	"	193	River St. Jean, No. 1	24
"	"	193	River St. Jean, No. 2	24
"	"	194	River St. Jean, No. 3	23
"	"	195	River St. Jean, No. 4	18
"	"	196	River St. Jean, No. 5	20
"	"	197	River St. Jean, No. 6	20
"	"	198	River Magpie, No. 1	32
"	"	199	River Chambers, No. 1	56

A total of 527 square miles more or less. Also a certain area of freehold land to be used as a mill site and fully described in deeds in the hands of the undersigned curators.

Conditions of Sale:—Ten per centum cash on adjudication, the balance payable upon transfer of the licenses, which transfers will have to be made at once, the transfer fee to be payable by the purchasers.

The purchaser will pay in addition to the purchase price, the auction duty of one per cent and will accept the licenses as they are without any responsibility on the part of the estate as to the condition, area or quality of the limits.

For inspection of the licenses and other particulars please apply to the undersigned:—

A. F. C. ROSS (Messrs. P. S. Ross & Sons),
142 Notre Dame St. West, Montreal.
EUGENE TRUDEL (Messrs. LaRue & Trudel),
Edifice Dominion, 126 St. Peter St., Quebec.

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COMMISSION TO INVESTIGATE CHARGES.

Sir Frederick Barker, formerly Chief Justice of New Brunswick; Judge McKeown, of the Supreme Court bench; and W. S. Fisher, of the firm of Emerson and Fisher, hardware merchants, St. John, have beeen appointed by Lieutenant-Governor Wood a commission to enquire into charges made by L. A. Dugal, M.P.P. for Madawaska, against Premier Flemming, and H. F. McLeod, M.P. for York County. Mr. Dugal charged that the Premier had extorted large sums of money from the lumbermen of the province in connection with their Crown land issues, and that Mr. McLeod had demanded and received a sum of money from a St. John Valley Railway contractor to which he was in no way entitled while he was Provincial Secretary of the province.

A CONTINUOUS WINDER.

W. Berkerly West, of Montreal, has invented a continuous winder for a paper machine for winding small rolls. The idea of the attachment is to obviate the stopping of the machine when changing rolls. Mr. West has applied for a patent for his invention.

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Timber Concessions in the Province of Quebec

Notice is given by the Government of the Province of Quebec, that, on the 11th of August, and on the 20th of October, 1914, permits to cut timber on over 8,000 square miles of Crown Lands will be offered at public auction.

The territory to be disposed of comprises some 1,200 square miles in the basins of rivers Ottawa, Harricana and Bell, in the Abbitibi region; 6,000 square miles in the Lake St. John northern region; 350 square miles in the Lake St. John East agency; 242 square miles in the Matapedia division.

On the first date above mentioned, permits will be offered at ordinary conditions on some 3,000 square miles.

The timber grants advertized for the 20th of October, comprising the basins of three large rivers in the Lake St. John region, with considerable water powers, will be subject to the obligation of manufacturing the wood into pulp or paper within the province of Quebec.

For particulars, please apply to the Department of Lands and Forests, Quebec, Canada.

ELZ. UIVILLE DECHENE,
Deputy-Minister of Lands & Forests.
Quebec, 11th April, 1914.

TIMBER SALE

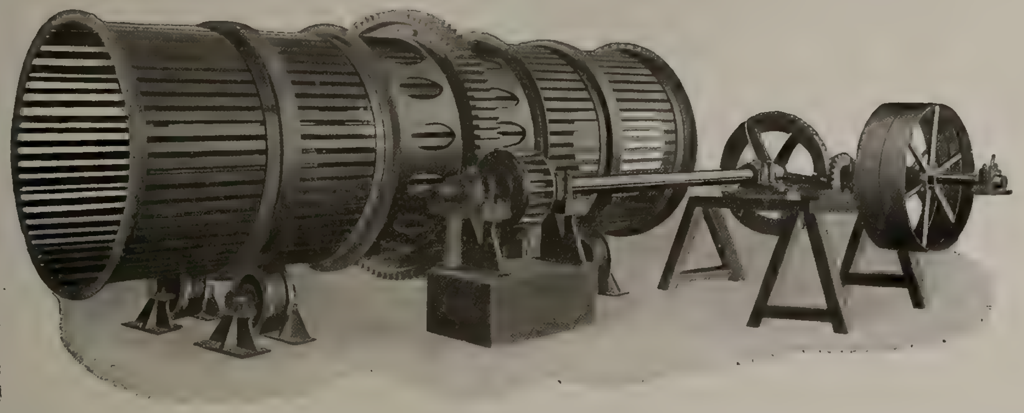
TENDERS will be received by the undersigned up to noon of the 6th day of July, 1914, for the right to cut the Red and White Pine timber on Berths 1 B, 1 C, and 1 D, in the Mississaga Forest Reserve tributary to the north shore of Lake Huron, each Berth containing an area of 36 square miles, more or less.

For maps and conditions of sale apply to the undersigned or the Crown Timber Agents at Thessalon, Sault Ste. Marie, Webbwood and Sudbury.

W. H. HEARST,
Minister of Lands, Forests and Mines, Toronto, April 18th, 1914.

BARKING DRUM

AUTOMATICALLY WORKING



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Capacity for Waterdriven Wood:

Small Type	13′ long	x $6\frac{1}{2}$′	diam.:	25-35 cords (10 hours)
Large "	20′ "	x $6\frac{1}{2}$′	"	35-45 " " "

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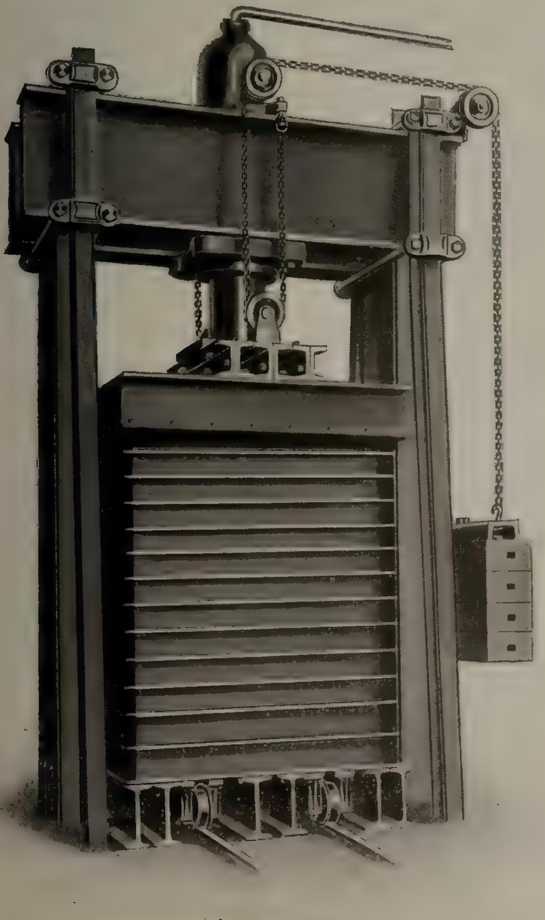

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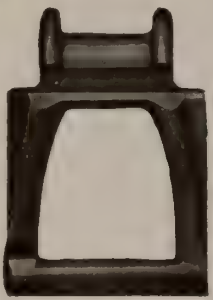

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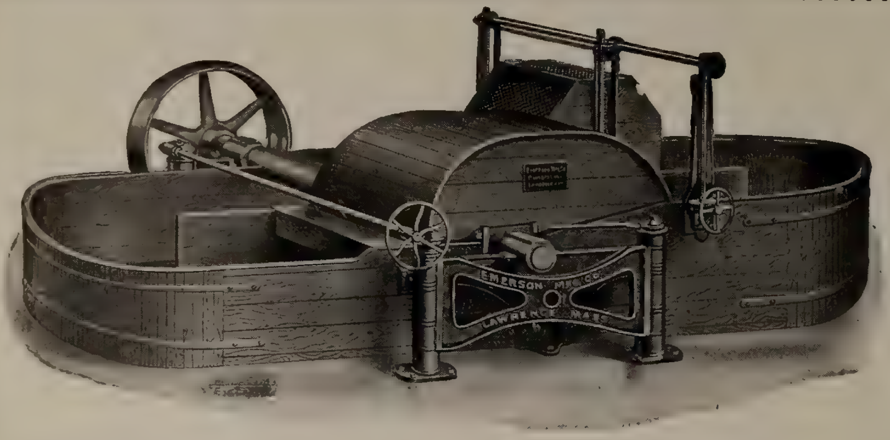
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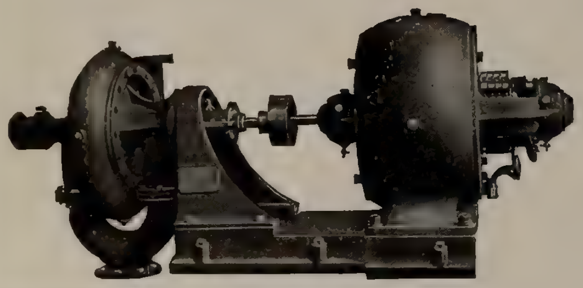

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- Federal Engineering Co., Toronto, Ont.
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- Brunner, Mond & Co., Montreal, Can.
- Hooker Electrochemical Co., Wall St., New York, N.Y.
- Klipstein, A. & Co., Ltd., Montreal, Can.
- Winn & Holland, Montreal, Can.

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- Tippet, A. P. & Co., Montreal, Can.
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- Westbye, P. P., Peterboro, Can.

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- Winn & Holland, Montreal, Can.

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Chain Blocks
- Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Chain Clutches
- Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

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- Boving & Co., of Canada, Limited, Toronto, Ont.
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- Valley Iron Works, Appleton, Wis.

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- Carthage Machine Co., Carthage, N.Y.

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- Boving & Co. of Canada, Limited, Toronto, Ont.
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- Smart-Turner Mach. Co., Hamilton, Ont.

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- Morris, Herbert, Crane & Hoist Co., Toronto. Ont.

Cranes—Hand Power
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Cranes—Wall
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Process Engineers, Ltd. Montreal, Can.

Rotary Sulphur Furnaces
Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Pulp Mill Machinery Co., Montreal, Can.
Stebbins Engineering and Manufacturing Co., Watertown, N Y

Runways—Hand operated
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Save-Alls
Boving & Co., of Canada, Limited, Toronto, Ont.
Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
Waterous Engine Works Co., Ltd., Brantford, Can.

Self Landing, Self Delivery Hoists
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Screen Plates
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.

Screens
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street. Toronto.
Glens Falls Mach. Wks., Glens Falls, N Y
Harmon Machine Co., Watertown, N.Y.
Jenckes Machine Co., Sherbrooke, Que.
Johnson, Chas., St. Henry, Que.
Marx & Co., J., London, England.
Process Engineers, Ltd., Montreal, Canada.
Sherbrooke Mach. Co., Ltd . Sherbrooke, Que.
Tippet Arthur P. & Co., Montreal, Cau.
Voith, J. M., New York, N.Y.
Voith, J. M., Wurtemberg, Germany.
Waterous Engine Works Co. Ltd., Brantford, Can.
Westbye, P. P., Peterboro, Can.

Shear Legs
Morris, Herbert, Hoist & Crane Co., Toronto, Ont.

Slings
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Slitters and Re-Winders
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Cameron Machine Co., Brooklyn, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Moore & White Co., Philadelphia, Pa.
Ticonderoga Machine Works, Ticonderoga, N.Y.

Smelting Furnaces
Boving & Co., of Canada, Limited, Toronto, Ont.

Straw Cutters'
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.

Straw Dusters
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.

Straw Digesters
Boving & Co., of Canada, Limited, Toronto, Ont.

Strawboard Making Machines
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.

Steam Regulator
Pickles, W. F., Buckland, Conn.

Stuff Chests
Boving & Co., of Canada, Limited, Toronto, Ont.

Suction Couch
Process Engineers Ltd., Montreal, Can.

Sulphite Mill Equipment
Boving & Co., of Canada, Limited, Toronto, Ont.
Process Engineers Ltd., Montreal, Can.
Stebbins Engineeringand Manufacturing Co., Watertown, N.Y

Sulphate Mill Equipment
Boving & Co., of Canada, Limited, Toronto, Ont.
Process Engineers Ltd., Montreal, Can.

Sulphur
Union Sulphur Co., 17 Battery Place, New York, N.Y.

Sulphur Burners
Boving & Co., of Canada, Limited, Toronto, Ont.
Glens Falls Machine Works, Glens Falls, N.Y.
Stebbins Engineering and Manufacturing Co. Watertown, N.

Tachometers (Hand and Stationary)
Boving & Co., of Canada, Limited, Toronto, Ont.
Schaeffer & Budenberg, Brooklyn, N.Y.

Track Systems
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Tanks
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Boving & Co., of Canada, Limited, Toronto, Ont.
Hamilton, Wm , Co., Peterboro, Can.
Jenckes Machine Co., Sherbrooke, Que.
McDougall, John, Caledonian Iron Works, Montreal, Can

Thermometers
Schaeffer & Budenberg, Brooklyn, N.Y.

Transmission Machinery
Caldwell, H. W. & Son Co., Chicago, Ill.
Canadian Allis-Chalmers, Limited, Toronto
Boving & Co., of Canada, Limited, Toronto
Jones & Glassco, Montreal, Can.

Traveling Cranes
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

MILL SUPPLIES---Continued

Turbines

Boving & Co., of Canada, Toronto, Ont.
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Smith, S. Morgan Co., York, Pa.
Voith, J. M. Co., Inc. New York, N.Y.
Voith, J. M., Wurtemberg, Germany.

Water Wheels

Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Hamilton, Wm. Co., Ltd., Peterboro, Can.
Smith, S. Morgan Co., York, Pa.
Voith, J. M., New York, N.Y.

Wire Cloth for Paper Machines

Chambers, Ltd., Toronto.
Christie, Geo., Ltd., Glasgow, Scotland.
Johnson, C. H. & Sons, Ltd., St. Henry, Montreal, Que
Kufferath, Andreas, Mariaweiler, Germany.
Tippet, Arthur P. & Co., Montreal, Can.
Taylor, J. A., Montreal, Can.
United Wire Works, Ltd., Edinburgh, Scotland.
Westbye, P. P., Peterboro, Can.

Waste

Hough, R., London, England.

Wet Machines

Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Glens Falls Machine Works, Glens Falls, N.Y.
Hamilton, Wm. Co., Peterboro, Can.
Norwood Engineering Co. of Canada, Ltd., Cowansville, P.Q.
Process Engineers, Ltd., Montreal, Canada.
Sherbrooke Machinery Co., Sherbrooke, Can.
Voith, J. M., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford Ont.

PULP AND PAPER MILL PRODUCTS

This aims to be a complete list of the products of Canadian Pulp and Paper Mills, who are urged to send us lists of brands and watermarks, as well as the headings under which they wish to be indexed. Buyers who cannot meet their requirements from this list, are invited to communicate with the editor, who is in close touch with the mills, and will gladly furnish full information.

PULP MILLS

Ground Wood Pulp

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
Basin Electric Light & Power Co., Ltd., Montmagny, Que.
Beaver Co. Ltd., Thorold, Ont.
Belgo-Canadian Pulp & Paper Co., Shawinigan Falls, Que.
Brompton Pulp & Paper Co., Brompton and E. Angus, Que.
Booth, J. R. Ottawa, Ont.
Bronson Co., Ltd., Ottawa, Ont.
Clyde River Pulp & Paper Co., Ltd., Liverpool, N.S.
Colonial Wood Products Co., Ltd., Thorold, Ont.
Campbell Lumber Co., Weymouth, N.S.
Canada Paper Co., Ltd., Montreal, Que.
Chicoutimi Pulp Co., Chicoutimi, Que.
Compagnie de Pulpe de Dalmas, Dalmas, Que.
Davy, James, Thorold, Ont.
Eddy Co., The E. B., Ltd., Hull, Que.
East Canada Power & Pulp Co., Ltd., Nairn Falls, Que.
Foley-Rieger Pulp & Paper Co., Ltd., Thorold, Ont.
Ford, J. & Co., Port Neuf, Que.
Jacques-Cartier Pulp & Paper Co., Montreal.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
La Cie de Metabetchouan, St. Andre, Que.
La Havre Pulp Co., Ltd., Bridgewater, N.S.
Lake Megantic Pulp Co., Lake Megantic, Que.
Laurentide Co., Ltd., Grand Mere, Que.
MacLaren Co., Ltd., The James, Buckingham, Que.
McLeod Pulp Co., Ltd., Liverpool, N.S.
News Pulp & Paper Co., Ltd., St. Raymond, Que.
Nicolet Falls Pulp & Lumber Co., Nicolet Falls, Que.
North Shore Power, Railway & Navigation Co., Clarke City.
Northumberland Paper & Electric Co., Campbellford, Ont.
Nova Scotia Wood & Pulp Co., Ltd., Mill Village, N.S.
Ontario Paper Company, Thorold, Ont.
Ouiatchouan Falls Paper Co., Ouiatchouan Falls, Que.
Powell River Co., Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que'
Price-Porritt Pulp & Paper Co., Rimouski, Que.
Reed, A. E. & Co., (Nfld.), Ltd., Bishop's Falls, Nfld.
River-du-Loup Pulp Co., Ltd., Fraserville, Que.
Soucy, F. Florentine, Old Lake Road, Que.
Spanish River Pulp and Paper Mills, Ltd., Espanola, Ont., Sturgeon Falls, Ont., Toronto, Ont., and Sault Ste. Marie, Ont
St. George Pulp and Paper Co., St. George, N.B.
Thorold Pulp Co., Ltd., Thorold, Ont.
Trent River Paper Co., Ltd., Frankford, Ont.
Union Bag & Paper Co., Cape Madeleine, Que.
Trent Valley Paper Mills, Glenmiller, Ont.
Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Q

Kraft

Brompton Pulp & Paper Co., East Angus, Que.
Dryden Timber and Power Co., Dryden, Ont.
New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
Quebec and St. Maurice Industrial Co., La Tuque, Que.
Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que

Soda Fibre

Canada Paper Co., Ltd., Montreal and Toronto.
Dominion Paper Co., Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.

Sulphite Fibre

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
Booth, J. R., Ottawa, Ont.
Dominion Pulp Co., Ltd., Chatham, N.B.
Edward Partington Pulp & Paper Co., Ltd., St. John, N.B.
Eddy Co., The E. B., Ltd., Hull, Que.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Lake Superior Paper Co., Ltd., Sault Ste. Marie, Ont.
Powell River Co., Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que.
Riordan Pulp & Paper Co., Ltd., Montreal, Que.
Spanish River Pulp and Paper Mills Ltd., Sturgeon Falls, Ont., and Sault Ste. Marie, Ont.
Swanson Bay Forests, Wood, Pulp & Lumber Mills, Ltd., Swanson, Bay, B.C.
Toronto Paper Mfg. Co., Ltd., Cornwall, Ont.

PAPER MILLS

Bag

Eddy, The E. B. Co., Ltd., Hull, P. Q.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
Ford, J. & Co., Port Neuf.
Wilson, Ltd., J. C., 61 St. Alexander Street, Montreal, Que.
Jonquiere Pulp Co., Jonquiere, Que.

Binders' Board

McArthur. Alex. & Co., Montreal.
Northumberland Paper and Electric Co., Campbellford, Ont.

Blotting

Canada Paper Co., Montreal, Que., "Velvet Blotting."

Board

See Wood Board and Cardboard Specials.

Bond

Canada Paper Co., Ltd., Montreal, Que. "Burmese Bond," "St. Lawrence Bond," "Canada Bond," "Burmese Linen Ledger," "Windsor Mills Special," "Silverstream," "Springvale," "Super Writing," "White Railway," "Railway Manilla."
Howard Smith Paper Mills. Ltd., Montreal & Beauharnois, Que.
Kinleith Paper Co., Ltd., St. Catharines, Ont.
Rolland Paper Co., St. Jerome, Que., Mount Rolland, Que. and Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Book and Litho

Canada Paper Co., Ltd., Montreal, Que. "Art Photo Book," "Tinted Art Book," "Art Chromo," "English Book," "Satin Book," "Satin Litho," "Litho Label," "Super S. C. Book," "Standard S. C. Book," "Windsor Book."
Eddy Co., The E. B. ,Ltd., Hull, Que.
Kinleith Paper Co., Ltd., St. Catharines, Ont.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Box Board

See Wood Board and Cardboard Special.

Dominion Timber Regulations

Licenses to cut timber on Dominion Lands in the Provinces of Manitoba, Saskatchewan, and Alberta, the Northwest Territories, within twenty miles on either side of the main line of the Canadian Pacific Railway in the Province of British Columbia, and in the tract of three and one-half million acres to be located by the Government of the Dominion in the Peace River district in the Province of British Columbia, lying east of the Rocky Mountains and adjoining the Province of Alberta, shall be disposed of by public auction at the office of the Dominion Timber Agent for the district in which the berths are situated.

Before any parcel of timber is offered for sale it shall be surveyed by a duly qualified Dominion Land Surveyor into berths of an area not exceeding twenty-five square miles, and each of such berths shall then be thoroughly cruised by a duly qualified timber cruiser in the employ of the Dominion Government. The Minister shall then fix an upset price at which the berth shall be disposed of, and no berth shall be sold at less than the price so fixed.

Purchases to the amount of one thousand dollars or under shall be paid in cash at the time of sale. Purchases over one thousand dollars and not exceeding five thousand dollars shall be paid, one-half in cash at the time of sale, and a note or notes shall be given for the remaining half of the purchase price, payable in three months, with interest at the rate of five per cent. per annum. Purchases over five thousand dollars and not exceeding ten thousand dollars shall be paid one-third in cash at the time of sale, and notes shall be given for the remaining two-thirds of the purchase price, payable in three and six months, with interest at the rate of five per cent. per annum. Purchases exceeding ten thousand dollars shall be paid one-fourth in cash at the time of sale, and notes shall be given for the remaining three-fourths of the purchase price, payable in three, six and nine months, with interest at the rate of five per cent. per annum. Notes shall be made payable at a bank in the city or town in which the sale is held or at a bank in the city of Ottawa. Cash payments must be made at the time of sale in legal tender or by an accepted cheque on a chartered bank, or by a draft issued by a chartered bank, payable to the order of the Deputy Minister of the Interior. If default is made in any payment required by this section the sale shall be forfeited and void.

The purchaser must also pay the cost or the estimated cost of the survey of the berth before a license is issued.

The licensee shall pay an annual ground rent of five dollars per square mile except for lands situated to the west of Yale, in the Province of British Columbia, in which case the yearly ground rent shall be five cents per acre.

The licensee shall pay the following dues on timber cut on his berth:—

Sawn lumber, 50 cents per thousand feet, board measure.

Railway ties, eight feet long, 1½ cents each.

Railway ties, nine feet long, 1¾ cents each.

Shingle bolts, 25 cents per cord.

And 5 per cent. on the sale of all other products of the berth.

Timber Permits

Yearly permits are granted to settlers, mine operators and others on application to the Dominion Timber Agents, from whom further information can be obtained.

W. W. Cory
Deputy Minister.

Department of the Interior, Ottawa,
December 20th, 1912.

PAPER MILLS---Continued

Bristol

Don Valley Paper Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.
Canada Paper Co., Montreal & Toronto, "King Bristol," "Windsor Bristol," "C. P. S.Tinted Bristol," "Canada Bristol."

Building and Sheathing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que.
British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
Eastern Paper Co., Ltd., St. Basile, Que.
Montreal Paper Co., St. Basil, Que.
Northumberland Paper and Electric Co., Ltd., Montreal.
Riordon Pulp and Paper Co., Ltd., Montreal, Que.
Western Paper Mills, Ltd., Vancouver, B.C.
Jonquiere Pulp Co. Ltd., Jonquiere, Que.
Ford, R. & Son, Port Neuf, Que.
Laurentide Co., Ltd., Grand Mere, Que.
McArthur, Alex. & Co., Montreal, Que.
McLeod Pulp Co., Ltd., Liverpool, N.S.
Walker, J. R. & Co., Montreal, Que.

Cardboard Specials

Hinde & Dauche Paper Co., Ltd., Toronto, Ont.
Jonquiere Pulp Co., Jonquiere, Que.
Macleod Pulp Co., Ltd., Liverpool, N.S.
Canada Paper Co., Windsor Mills, Que. "Victor Printers' Blanks," "Superior Translucent Bristol," " C.P.C. Coated Litho," "Superfine Litho Blanks."
Booth, J. R., Ottawa, Ont.
Eddy, E. B. Co., Ltd., Hull, Que.
Laurentide Co. Ltd., Canada Life Building, Montreal, Que.

Carpet Lining

Ford, J. & Co., Port Neuf Station, Que.
Montreal Paper Co., St. Basile, Que.
Northumberland Paper & Electric Co., Ltd., Campbellford, Ont.
Wentworth Paper Mills, West Flamboro, Ont.
Western Paper Mills, Ltd., Vancouver, B.C.

Coated

Ritchie & Ramsay, Toronto, Ont.
Georgetown Coating Mills, Ltd., Georgetown, Ont.
National Paper Co., Valleyfield, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.

Corrugated Paper

Lazier Paper Mills, Ltd., Belleville.
Hinde & Dauche Paper Co., Ltd., Toronto, Ont.

Cover

Canada Paper Co., Ltd., Montreal and Toronto, "Tinted Art Cover," "Derby Cover," "Fibrestoc Cover," "Cashmere Cover," "X Cover," "XX Cover."
Eddy Co., The E. B. Ltd., Hull, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Ritchie & Ramsay, Toronto, Ont.

Envelope

Don Valley Paper Co., Ltd., Toronto.
Kinleith Paper Co., Ltd, St. Catherines, Ont.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Felts

Bird, F. W. & Sons, Hamilton, Ont., and Pont Rouge, Que.
Eastern Paper Co., Ltd., St. Basile, Que
McArthur, A. & Co., Montreal, Que.
Ford, J. & Co., Port Neuf, Que.
Ford, R. & Son, Port Neuf Station, Que.
Montreal Paper Co., St. Basile, Que.
Northumberland Paper & Electric Co., Ltd., Campbellford.
Western Paper Mills, Ltd., Vancouver, B.C.

Fibre

Canada Paper Co., Ltd., Montreal and Toronto.
Dominion Paper Co., Montreal, Que.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
McArthur, Alex. & Co., Montreal, Que.
Riordon Pulp and Paper Co., Merritton, Ont.
Strathcona Paper Co., Strathcona, Ont.
Wilson, Ltd., J. C., Montreal, Que.

Flour Sacks

Eddy Co., The E. B., Ltd., Hull, Que.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal.

Glazed

Provincial Paper Mills Co., Ltd., Toronto, Ont.

Hanging

Lincoln Paper Mills Co., Ltd., Merritton, Ont.
McArthur, Alex. & Co., Montreal, Que.
Moira Paper Mills, Belleville, Ont.
Riordon Pulp and Paper Co., Ltd., Montreal, Que.
Strathcona Paper Co., Strathcona, Ont.

Kraft

Brompton Pulp & Paper Co. Ltd., East Angus, Que.
Dominion Paper Co. Ltd., Montreal, Que.
Dryden Timber and Power Co. Ltd., Dryden, Ont.
New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que.

Leather Friction Board

Walker, J. R. & Co., Montreal, Que.

News

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
Belgo-Canadian Pulp and Paper Co., Shawinigan Falls, Que.
Booth, J. R., Ottawa, Ont.
Canada Paper Co., Ltd., Montreal and Toronto, "Canada Brand."
Eddy Co., The E. B., Ltd., Hull, Que.
Ford, Joseph & Co., Port Neuf, Que.
Fort Frances Pulp & Paper Co., Ltd., Fort Frances, Ont.
Jonquiere Pulp Co., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Lake Superior Paper Co., Sault Ste. Marie, Ont.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
McArthur, Alex. & Co., Montreal, Que.
Miller Bros. Co., Ltd., Glenmiller, Oht.
News Pulp & Paper Co., Ltd., St. Raymond, Que.
Powell River Co. Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que.
Riordon Pulp and Paper Co., Ltd., Montreal, Que.
Spanish River Pulp & Paper Mills, Ltd., Toronto, Ont.
Ontario Paper Co., Thorold, Ont.

Roofing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que
Ford, Joseph & Co., Port Neuf, Que.
Ford, Rowland and Son, Port Neuf, Que.
Montreal Paper Co., St. Bazile, Que.
Walker, J. R. & Co., 35 Common, Montreal, Que.
Western Paper Mills, Ltd., Vancouver, B.C.

Straw Board

Ford, J. & Co., Port Neuf, Que.
Lazier Paper Mills, Ltd., Belleville.
Lincoln Paper Mills Co., Ltd., Merritton, Ont
McArthur, A. & Co., Montreal, Que.
Moira Paper Mills, Belleville, Ont.
Northumberland Paper & Electric Co., Campbellford, Ont
Trent River Paper Co., Ltd., Frankford, Ont.
Trent Valley Paper Mills, Glenmiller, Ont.

Tag

Don Valley Paper Co., Ltd., Toronto, Ont.
Eddy, The E. B. Co., Ltd., Hull, Que.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
J. R. Booth, Ottawa, Ont.

Tissue and Toilet

Eddy Co., The E. B., Ltd., Hull, Que.
Garden City Paper Mills, Ltd., St. Catharines, Ont.
Interlake Tissue Mills, Ltd., Merritton, Ont.
Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Que

Wall Board

Beaver Co., Ltd., Beaverdale, Que.
Bishoprick Wallboard Co., Ottawa, Ont.

Wood Board

Beaver Co. Ltd., Thorold, Ont.
Booth, J. R. Ottawa.
Brompton Pulps Paper Co. Ltd., East Angus, Que.
Canada Paper Co., Montreal, Que.
Eddy Co., The E. B., Ltd., Hull, Que.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Northumberland Paper & Electric Co., Campbellford, Ont.
McLeod Pulp Co., Liverpool, N.S.
Western Paper Mills, Ltd., Vancouver, B.C.
Wilson, J. C. Ltd., 61 St. Alexander St., Montreal Que

Wrapping

Booth, J. R., Ottawa, Ont.
Canada Paper Co., Ltd., Montreal and Toronto, "Scotch Fibre," "Invictus Fibre," Hercules Manilla," "St. Fancis Manilla," "Wave Crest Drug."
Dominion Paper Co., Montreal, Que.
Don Valley Paper Co., Ltd., Toronto, Ont.
Eddy Co., The E. B., Ltd., Hull, Que.
Ford, J. & Co., Port Neuf, Que.
Ford, Rowland, Port Neuf, Que.
Gore Valley Paper Mills, Dundas, Ont.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Canada Paper Co., Monreal and Toronto.
See also Kraft.

Writing

Howard Smith Paper Mills Ltd., Beauharnois, Que.
Kinleith Paper Co. St. Catherines, Ont.
Rolland Paper Co., Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Manufacturing Co., Cornwall, Ont.

THE PROVINCE OF ONTARIO

is rich in timber, mineral, agricultural, and other resources.

Ontario has large areas of White Pine and other valuable timbers, her timber products last year representing one-third of the total output of Canada.

Ontario has pulpwood areas practically illimitable, and offers a great field for those desirous of embarking in the pulp and paper-making industry.

Ontario has innumerable waterfalls capable of supplying power for all manufacturing purposes, which are obtainable on reasonable terms, subject to development.

Ontario has large pulp and paper mills in operation at Ottawa, Sturgeon Falls, Spanish River Sault Ste. Marie and Dryden and large plants are under construction at Abitibi on the Temiskaming and Northern Ontario Railway, and Fort Frances on the Rainy River.

Ontario is traversed East and West by three great transcontinental railways, and North and South by three others.

For full particulars as to Ontario's great resources and the advantages offered for large wood-using industries apply to

Hon. W. H. Hearst

Minister of Lands, Forests and Mines

Toronto

Paper Mill Agents and Commission Merchants

Calgary, Alta.

Davis, W. D. & Co., 3rd Street, W., and 7th Avenue.
John Martin Paper Co., Ltd.
Tees & Persse.

Edmonton, Alta.

Tees & Persse.
John Martin Paper Co., Ltd.

Saskatoon, Alta.

Tees & Persse.

Vancouver, B.C.

Brake, Creedon Co., Ltd.
Mitchell Bros., 123 Cordova E.
Smith, Davidson & Wright.

Victoria, B.C.

Mitchell Bros., .8 Bastion.

Moose Jaw, Sask.

Tees & Persse.

Regina, Sask.

Tees & Persse.

Winnipeg, Man.

Barber & Ellis.
Clark Bros. & Co., Ltd., 143 Portage.
Ratcliffe Paper Co., Ltd.
Hudson Paper Co.
Kilgour Bros.
Martin, John, Paper Co., Ltd., 319 William.
McAllister & Watts.
McFarlane, Son & Hodgson, Bannatyne and Adelaide.
Tees & Persse.
John Martin Paper Co., Ltd.

St. John, N.B.

Schofield Paper Co., Ltd., 26-30 Prince William.

Moncton, N.B.

Reid, F. P. & Co.

Halifax, N.S.

Eastern Supply & Paper Co., 28 Bedford Row.
Latter, N., 104½ Windsor.
Allen, T. C. & Co.

New Glasgow, N.S.

McGregor, R. & Co.

Kingston, Ont.

Hendry, J. A., 875 Princess.

Hamilton, Ont.

Buntin, Gillies & Co., Ltd., John and Jackson.
Powis, A., 64 King E.

Ottawa, Ont.

Barnard, W. R., 374 Bank St.
Reid, C. De Wolf.

Port Arthur, Ont.

Tees & Persse.

Toronto, Ont.

Barber-Ellis Co., Ltd., 71 Wellington Street, W.
Brown Bros., Ltd., 51 Wellington Street, W.
Buntin, Reid Co., 13 Colborne.
Canada Paper Co., Ltd., 112 Bay Street.
Ratcliffe Paper Co., Ltd.
Fisher, E. W., 215 Victoria.
Gaine, T. & Son, 124 Richmond W.
Gage, W. J. Co., Ltd., 84 Spadina Ave.
Hodge-Sheriff Paper Co., McKinnon Building.
Howell, G. A. Co., 10 Wellington E.
Livingstone, H. E. & Co., 80 George.
McNairn, J. H., 5 Jarvis.
Thorne, A. M. & Co., 45 Colborne Street
Victoria Paper & Twine Co., Ltd., 415 King W.
Waters Bros., 33 Front E.
Whyte, Alex., 64 Wellington Street, W.
Wilkinson, E. H., Telephone Building.

Montreal, Que.

Dawson, W. V. & Co., 17 De Bresoles.
Dickinson, John & Co., Ltd., 216 Lemoine.
Little, T. B. & Co., 23 Cote.
Lloyd, Ed., Ltd., Eastern Townships Bank Building
McFarlane, Son & Hodgson, 14 St. Alexander.
Reid, C. DeWolf, Herald Bldg.
Robertson & Parker, St. Paul.
Rolland, J. B. & Son, 14 St. Vincent.
Smith, Howard, Paper Mills, Ltd., 138 McGill.

Quebec, Que.

Andrews, F. H. & Son, 64 St. Paul.
Rolland, J. B. & Son, 36 St. Paul.

Foreign

Salomon & Co., Felix, New York City,
Whitaker Paper Co., Cincinnati, Ohio.
Castle, Gotheil & Overton, New York, N.Y.
Churchill & Sim, Clements Lane, London, E.C., Eng.
Parsons Trading Co., 1 Battery Place, New York.
Pulp and Paper Trading Co., Temple Court Building, New York.
Scandinavian American Trading Co., New York, N.Y.

WANT AND FOR SALE

MILLWRIGHTS wanted for new Pulp Mill in Ontario; must be experienced in erection of machinery; state experience and wages required Abitibi Pulp and Paper Co., Ltd., Iroquois Falls, Ont.

WANTED—Experienced man for operating sheet cutter. Preference given to a man speaking both French and English. Belgo Canadian Pulp & Paper Co., Ltd., Shawinigan Falls, P.Q.

PULP & PAPERMAN—College graduate, wants position. Several years' experience as superintendent and general foreman in pulp mill. Last four years in construction and engineering office. Box 80, Pulp and Paper Magazine, Montreal.

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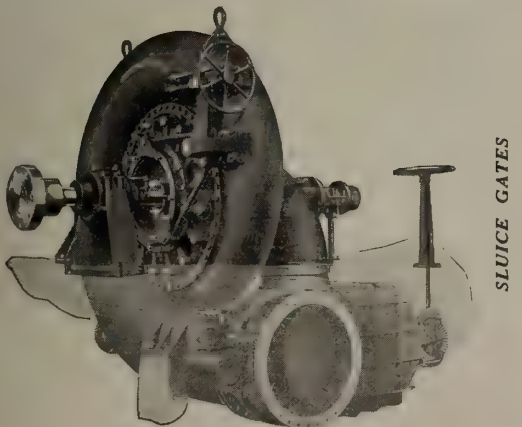

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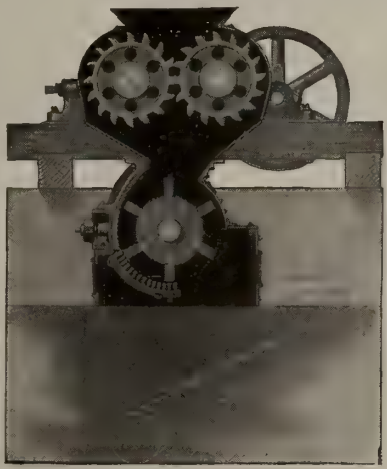

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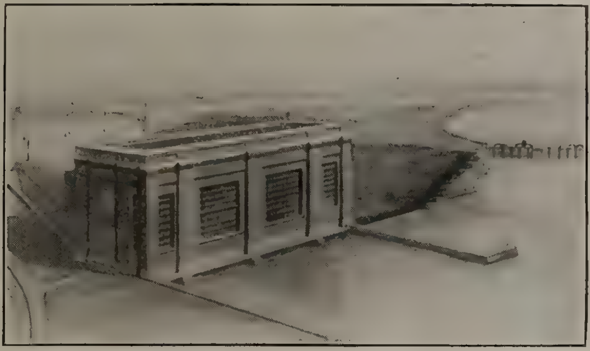
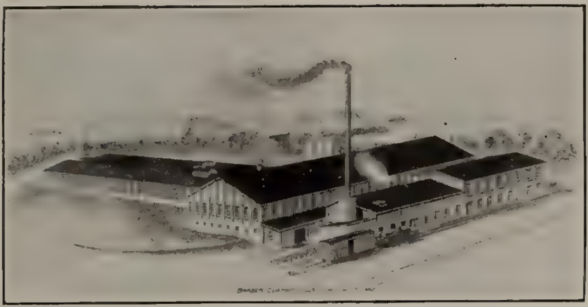


Montrose Power Plant, Merritton, Ont.

St. Lawrence Paper Mill, Mille Roches, Ont.



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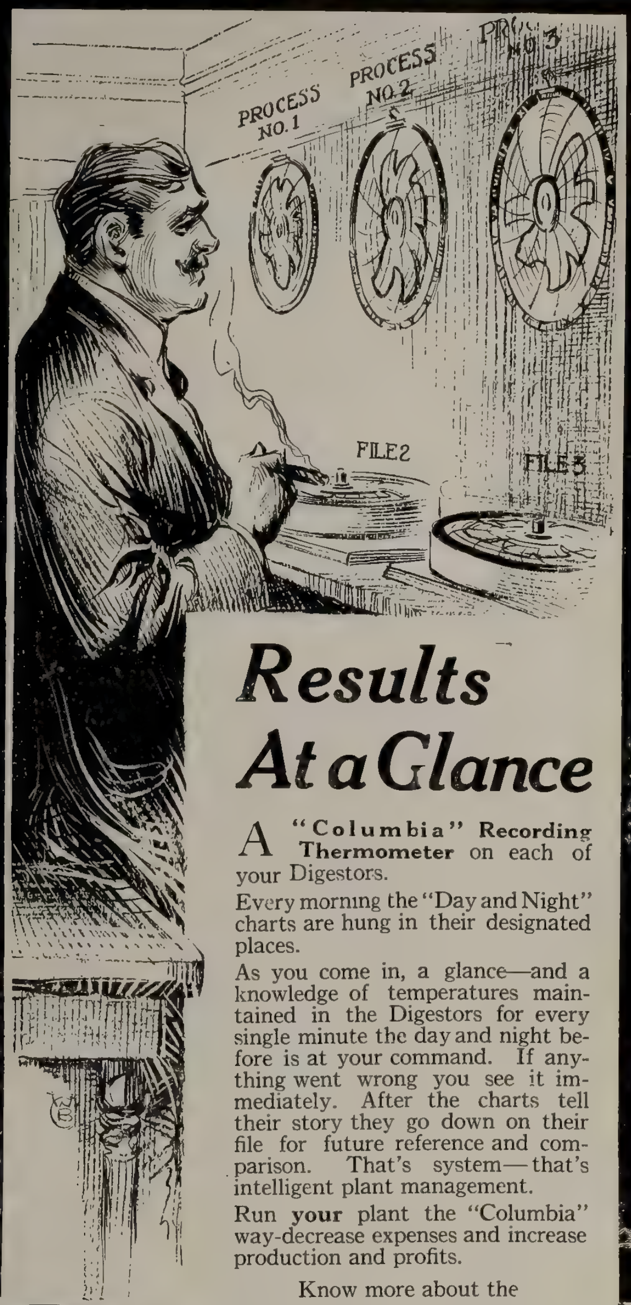

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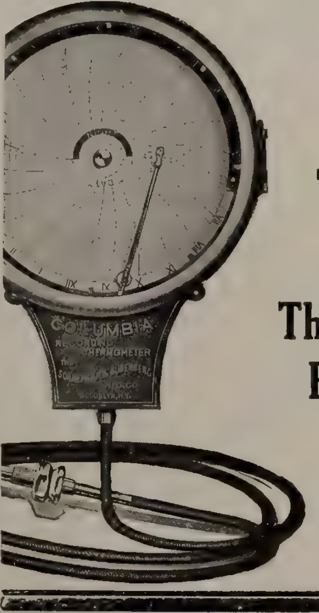

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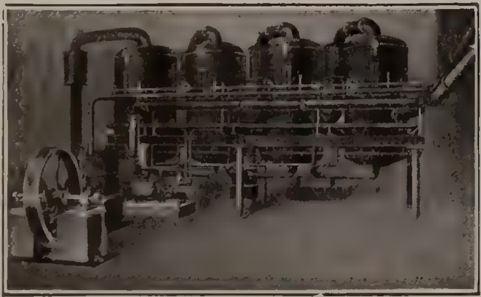

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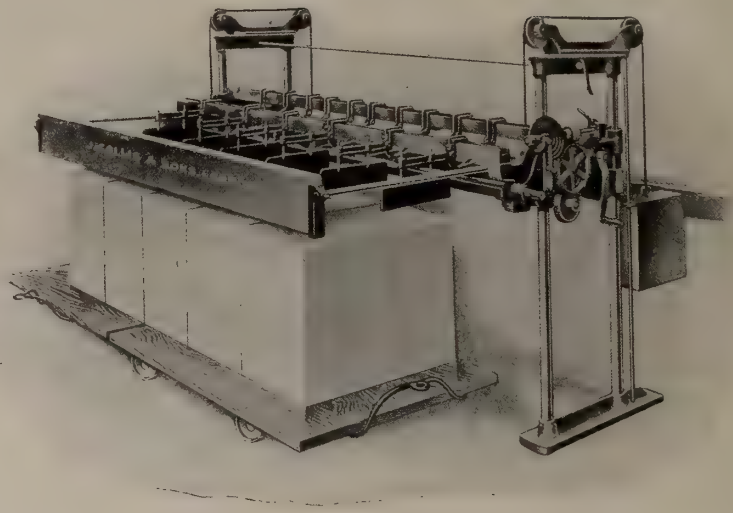

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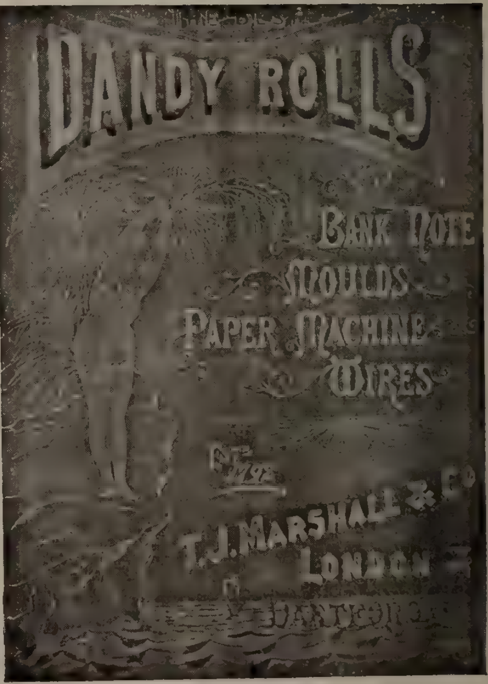

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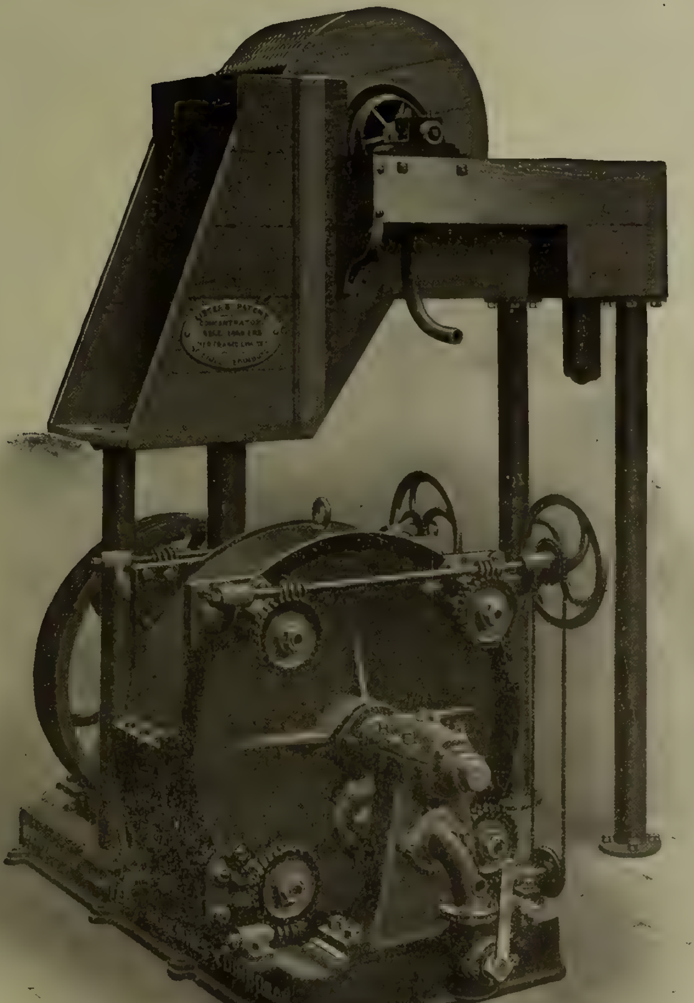

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Code Word:-"REFINCONCE"

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owing to the fact that pulp will not pass through the second set of Bars
UNTIL PROPERLY REDUCED
Fibres which are sufficiently reduced pass easily through, while the unreduced Fibres are repeatedly brought under the action of the Bars
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Saves steam

It also retains the proper amount of moisture in the paper thus eliminating the breaks at the calenders.

This regulator gives you a higher and more uniform finished paper with less calendering.

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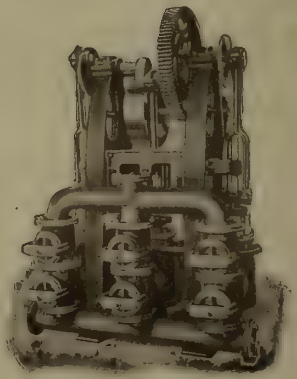
BUCKLAND CONN.



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CONDENSERS
VACUUM PUMPS
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CENTRIFUGAL PUMPS

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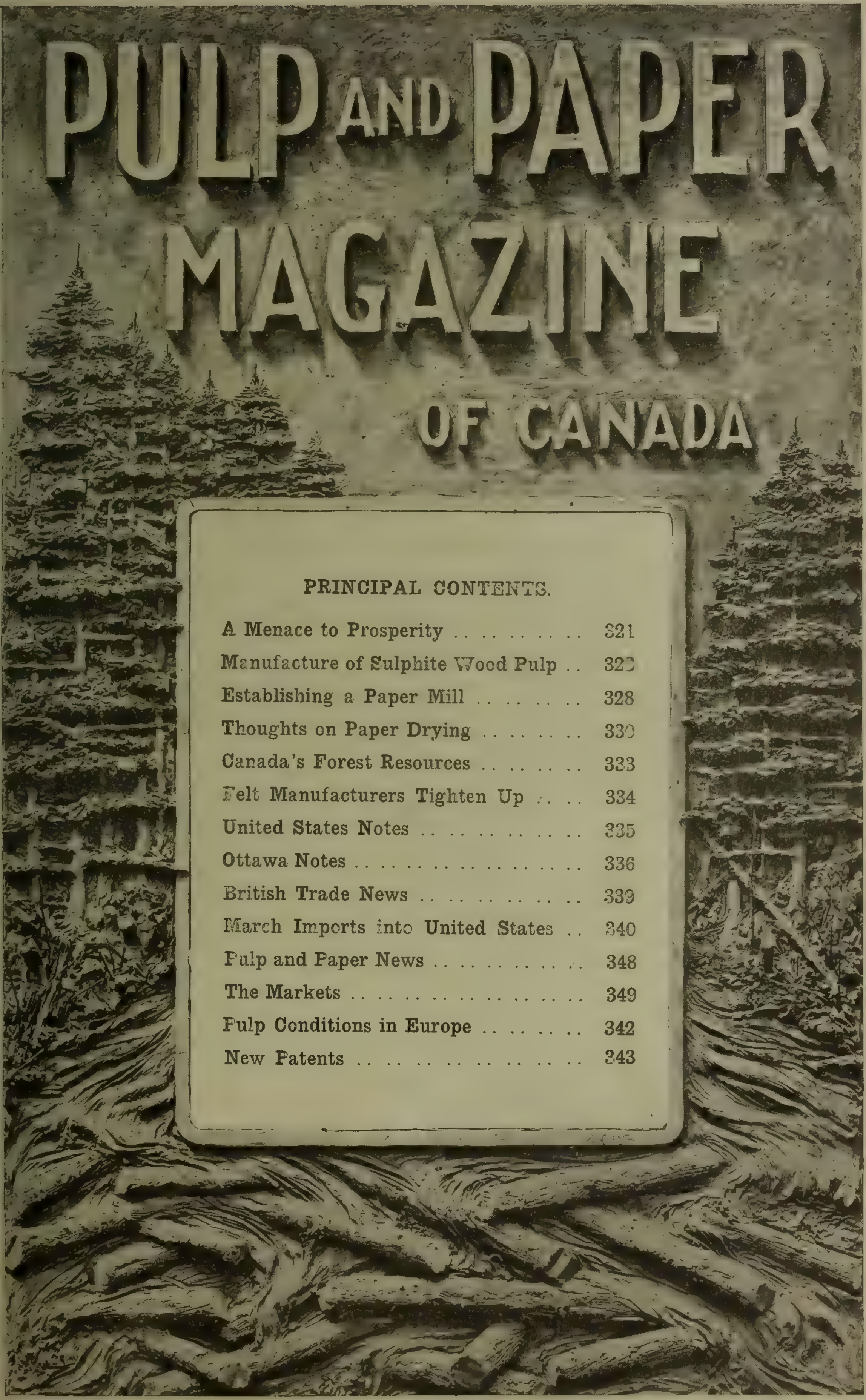
HAMILTON - CANADA

VOL. XII. MONTREAL, JUNE 1, 1914 No. 11



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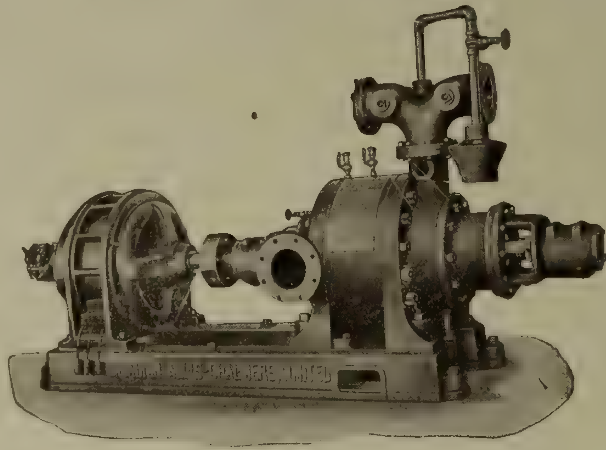
MATHER AND PLATT

TURBINE PUMPS



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Superintendent---Easiest thing in the world. We use RICEBARTON cooling rolls; a simple device,---let me show you.

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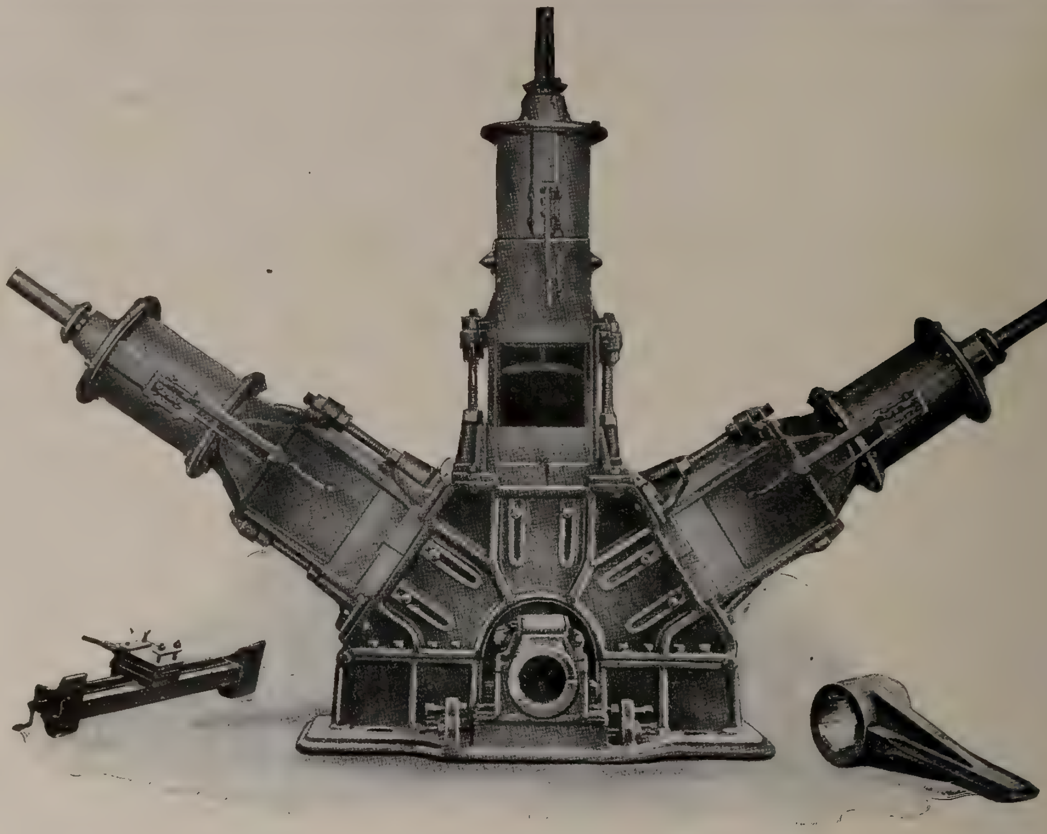

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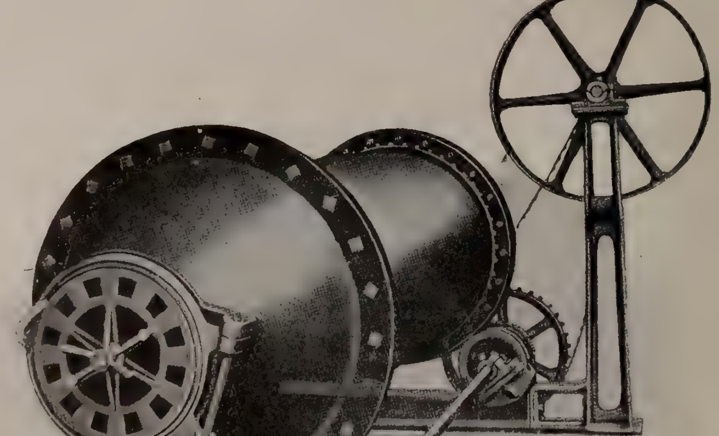

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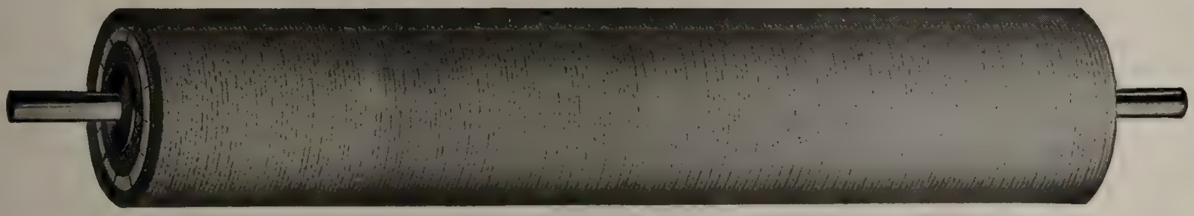

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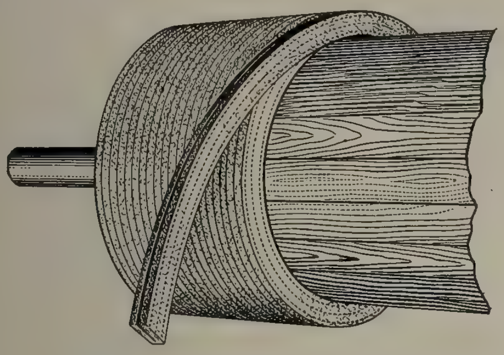

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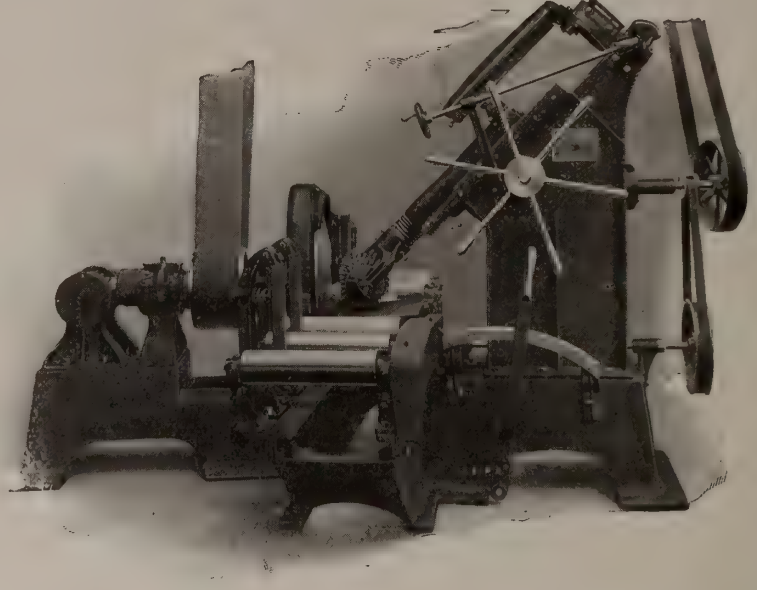

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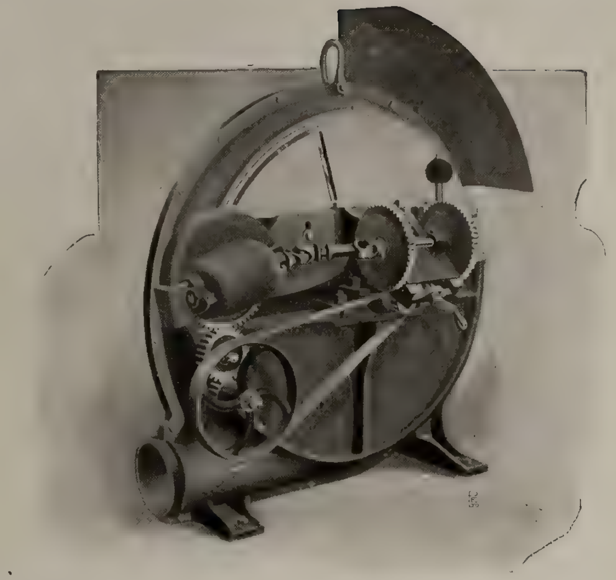

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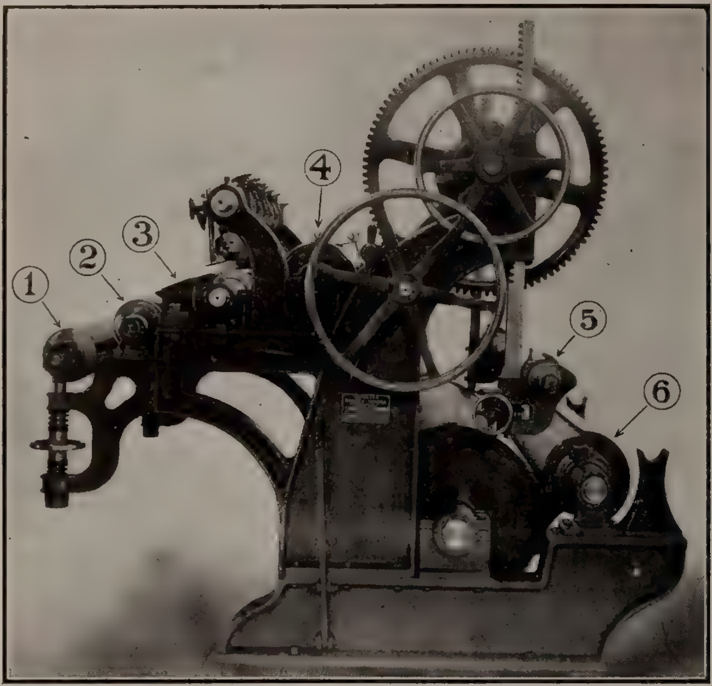

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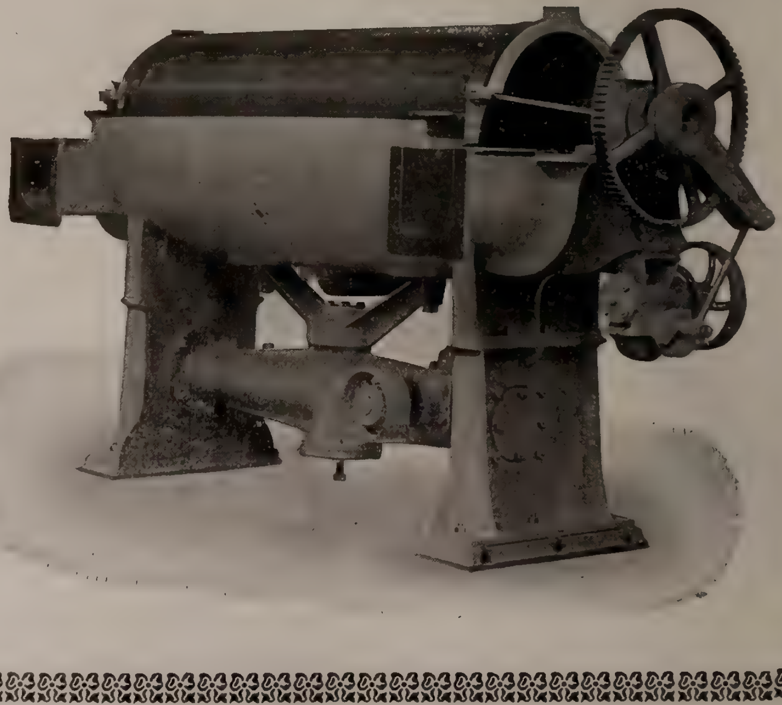

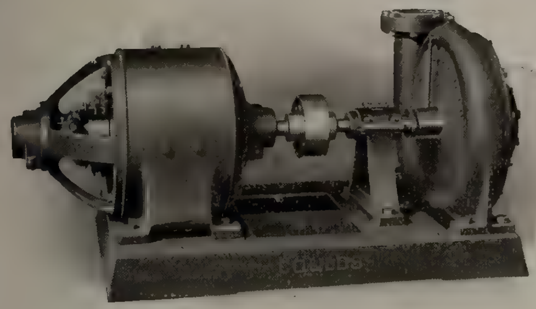

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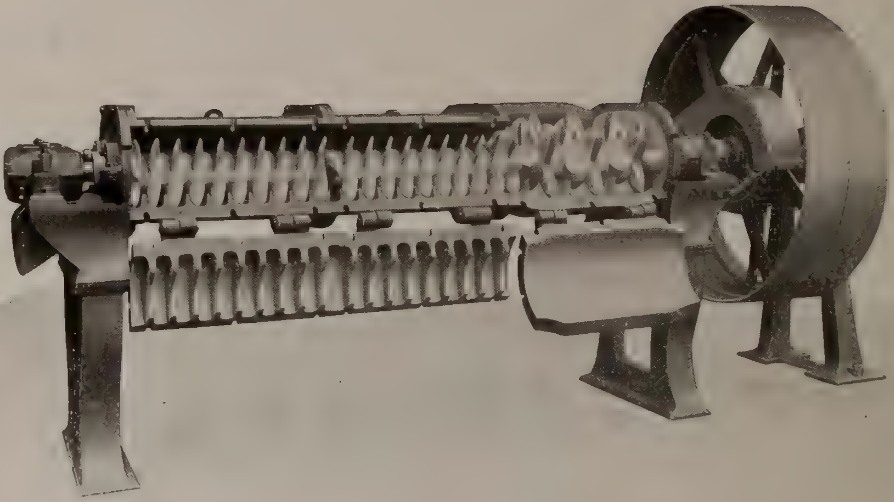

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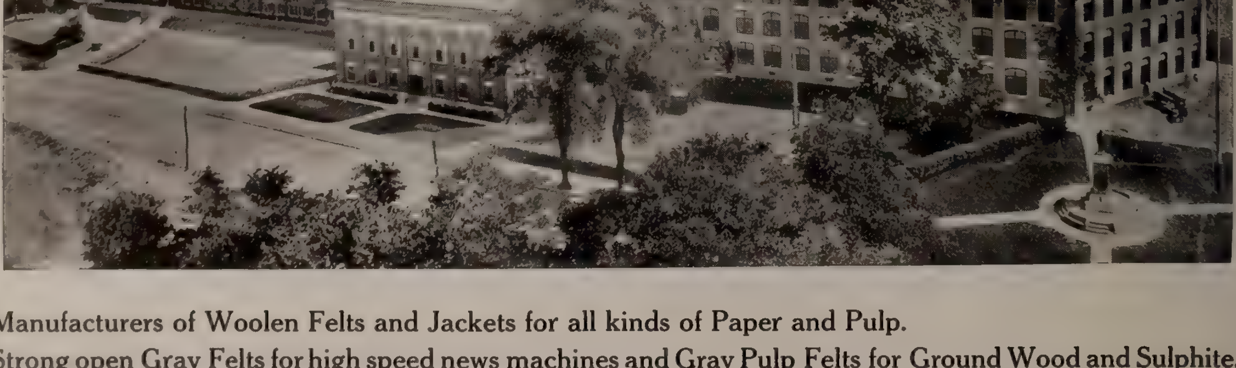

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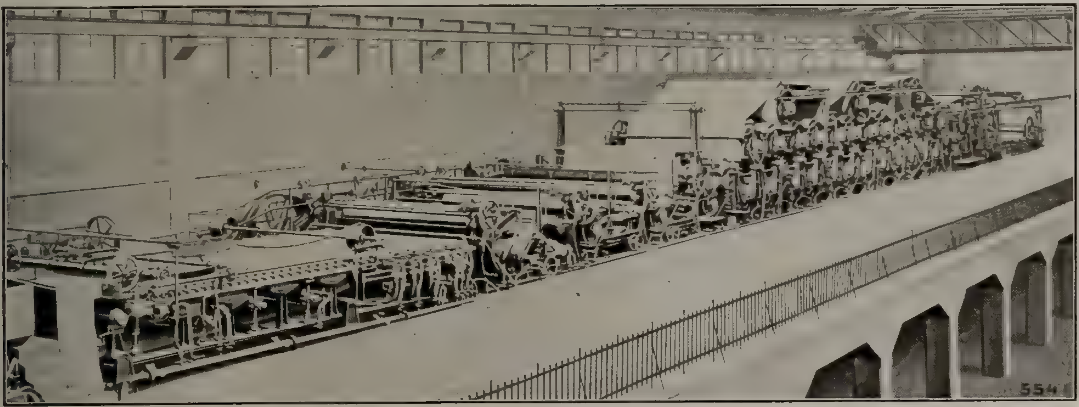

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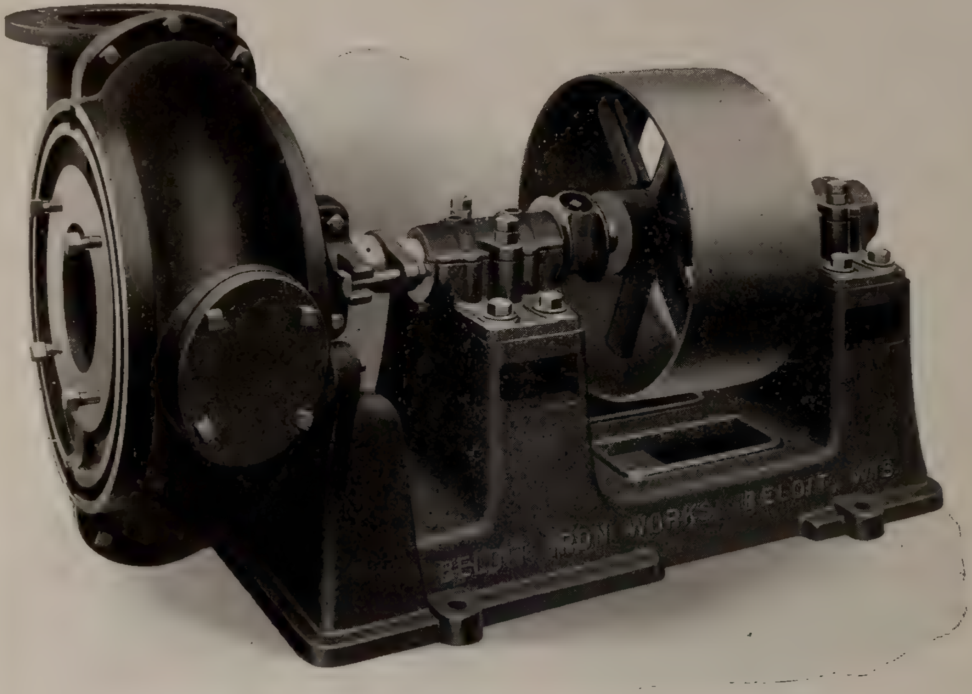

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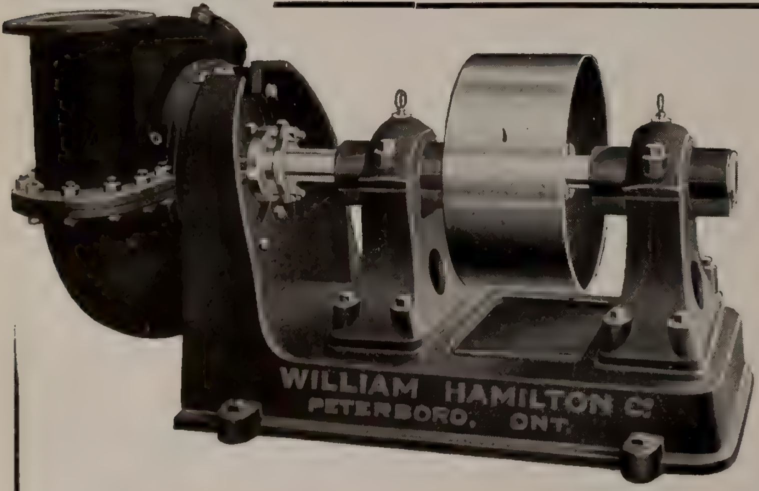

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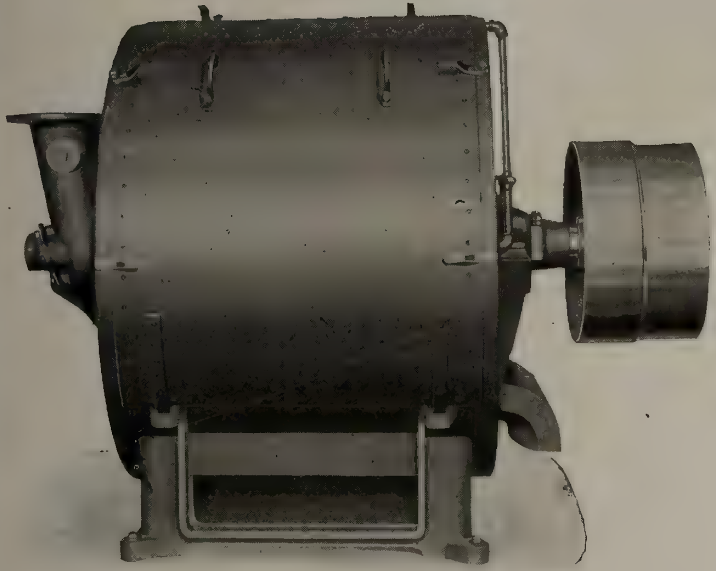

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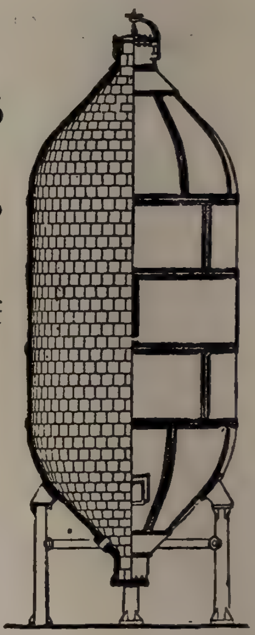

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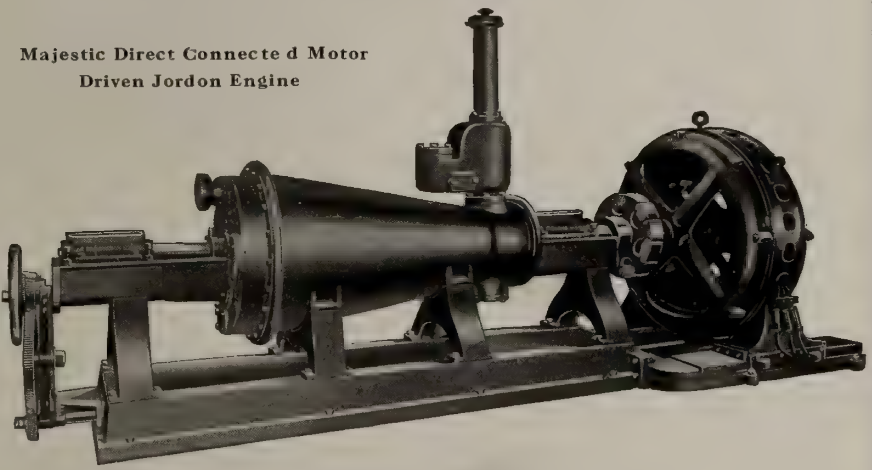

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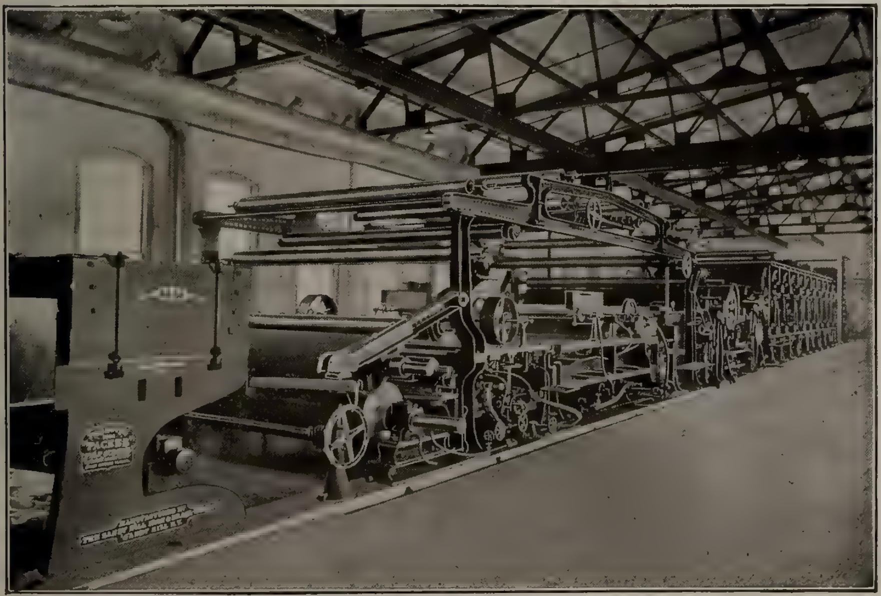

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VOL. XII. **MONTREAL, JUNE 1, 1914** **No. 11**

A Menace to Prosperity

In the past three weeks we have had in almost every part of the Dominion a recurrence of one of our greatest national evils. Forest fires are reported in the Maritime Provinces, Gaspe, Western Quebec, the Ottawa Valley, Northern Ontario and British Columbia. Timber limits, mills and towns have been endangered and in some cases have fallen prey to the flames. The River St. Lawrence has been so overcast with smoke as to render navigation dangerous, and in Nova Scotia and Ontario hundreds of people have been forced to abandon their property and flee for their lives. Coming at the beginning of the summer, these fires augur ill for the near future, when the weather will be warmer and the woods dryer. Some portions of Northern Ontario stand in particular danger, since the great storm which swept over the Great Lakes last fall blew over the shallower-rooted trees on great areas. When the tops dry out, the fire hazard will be very great. Indeed, it may be safely said that these areas of wind fall are certain to be burned over. And if the experience of the last two generations teaches us anything, it is that our green timber is in jeopardy to almost as great an extent.

Leaving out of consideration altogether the immediate losses of timber, pulpwood and movable property, the losses which are going on year after year are such as the country cannot afford to sustain. The report of Dr. C. D. Howe and Mr. J. H. White, experts who have investigated conditions in the Trent Watershed in Central Ontario for the Commission of Conservation during the past two summers, shows conclusively that it is utterly impossible for commercial timber lands to withstand repeated fires. The land is so impoverished that even the poorest tree growth is wiped out. And yet year after year we allow our forests to be ravished by fire. We have long since passed the stage when this is a transitory ill. Sentimentalism may once have existed in connection with claims for forest protection; such was possible while there were millions of acres of rich timber. But the rise of lumber prices in the past twenty years, far exceeding the increase in any other standard commodity, is an indication of the scarcity of standard sizes of timber. More and more the world is tending to utilize small sizes and to substitute cement, steel, clay and glass products. The foremost product of the forest in the future will undoubtedly be its pulp. The sawmill will give way to the pulp mill, just as wooden boxes are being augmented and supplanted by cardboard boxes, and fine interior finish by pulp wall board.

Maintenance of the forest is now a matter of more vital import to the pulp manufacturer than to any other person whose raw material lies in the woods. His mill, to meet the demands of modern consumption, must be a huge affair. It costs so much as to make long term investments imperative. It cannot be readily moved. Hence the supply of pulp wood must be continuous or the concern will surely have difficulties through stress of competition. To a pulp business of the future, forest destruction is to be counted with mill destruction.

Further, it has been proven beyond a doubt that forests have an influence on waterflow; that when the forests are burned, the equability of the streams and the clearness of the water are noticeably altered. The pulp man needs even flow for power and clear water for clean pulp. If the forest cover on the watershed, in which he is operating, is burned, he is liable to get neither.

Many agencies are at work in the Dominion to prevent the spread of fires. Not the least among these are the owners of timberlands, who have in many cases spent immense sums to maintain an efficient patrol upon their lands. The Railway Commission has ushered in a new area in fire protection methods in its regulations concerning control and brush disposal along rights of way, and the Government officials are heartily co-operating in the laudable work. The Canadian Foresters Association and the Press of Canada have done great educational work among the public. The co-operative protective association has made its appearance, as in the St. Maurice Valley. But there is still practically an untouched field of endeavor. Fire risks in the woods can be reduced under efficient methods to a mere fraction of a per cent. of the value of the standing timber. Whereas some European countries are expending from two to ten dollars an acre on their forest properties, Canada is spending much less than one cent an acre. There is still a vast inertia in this country with respect to forest protection. The people do not realize the great value of the forest resources nor the imminent danger to which it is subject.

As those having most vital and lasting interest in the maintenance of the forest, pulp manufacturers can well afford to lend their aid to every movement in the direction of protection. Is not this a matter which might receive not only the support, but the active participation of the Pulp and Paper Association? Organized effort is the key to success.

EDITORIAL COMMENT

We this issue we complete the series of articles on the manufacture of Sulphite Pulp, by Mr. G. B. Steffanson, which, to judge by the correspondence which has been received, has been of extraordinary interest to the members of the industry. It is not often that a subject is treated with the competence and accuracy which has been seen in this series. Mr. Steffanson's position among the top-notchers of the pulp profession, means much to the reader. The publishers of the Pulp and Paper Magazine propose to secure in the future other authorities to deal with basic subjects in an authoritative way.

With negotiations for peace between United States and Mexico going rapidly forward at Niagara Falls, Ont., and the Mexican leader Huerta in evident distress because of the attacks of the rebels, it is most probable that the threatened international hostilities will cease. This news will be received with enthusiasm by pulp manufacturers, despite the fact that a war would mean an increase of 20 per cent. in the demand for news print. This would tax the capacity of every mill in Canada and the United States.

The opinion of the London, Eng., Timber Trade Journal on the effect of the Ulster difficulties on Canadian forest products will be of particular interest to those firms conducting businesses where the movement of lumber to a certain extent influences the production of pulp. According to this journal, there is a noticeable depression in the spruce market. "The buyers of this material are fighting shy of purchasing except from hand to mouth, and until the political position is more settled the spruce market will not find relief there. Allowing for the difference in freights, the results to shippers should be equal to those of last year's trading. Unfortunately there seems to be generally a lack of confidence in the trade, and the sooner this pessimism is overcome the better for everybody."

POINTS WORTH KNOWING.

(Continued from Issue of May 15th.)

11. The high finish on brown wood board is obtained not only by the mechanical treatment of the finished product. The addition of paraffin, talc, graphite in the beater and the employment of well cooked cellulose and "hot-ground" wood-pulp readily enable the desired high finish to be obtained. When the board is finished by means of agate, soap-powder gives only an unstable glaze.

12. The work in the beater by no means primarily decides how the paper turns out. In rag papers the work in the sorting room is of primary importance, and in cellulose and mechanical wood-pulp papers the kind of the growth of the timber employed comes first, then the kind of cooking or grinding, and only thirdly the work in the beater.

13. The ordinary friction brake of the reeling machine and supercalender is by no means not always the best for obtaining good winding and glazing free from folds. A band-brake recently introduced into Scandinavia and England consisting of a thin steel band 20 cms. broad admits of almost perfect regulation when the paper runs badly.

14. The electric iron is without doubt preferable to all the other irons mentioned for pasting together tears in the paper-web. The uniform heat of the electric iron prevents the pasted place becoming undone which readily occurs with an overheated iron.

15. Tears are preferably joined not with solutions of adhesive material, but with caoutchouc bands as thin as paper and about 1 cm. broad which, as is known, are ironed.

16. It is by no means always necessary to arrange a top-felt press in the paper-machine. In one case the waste was diminished by 8—10 per cent by working without a top-felt press. Sufficient glaze was obtained by the moist and dry calenders.

17. In cross-cutters the grasping tongs are preferably substituted by a pneumatic distributing device.

18. Bronze beater-knives are by no means not uneconomical on account of their high price because, in contradistinction to steel knives, they still possess a considerable value for old metal after being quite worn out. In addition, bronze knives prevent white pulp becoming grey.—Papier-Fabrikant.

MANUFACTURE OF SULPHITE WOOD PULP

By G. B. STEFFANSON.

(Specially Written for the Pulp and Paper Magazine.)

ARTICLE III.

(Concluded from Last Issue.)

Screen Room and the Screening.

To get rid of sand and other heavy articles that collect in the pulp, from the mill yard, from the digester lining and from other sources, and to get rid as well of the largest knots before the pulp reaches the coarse screen, rifflers are extensively used.

The most common rifflers consist of one or more shallow horizontal troughs. In the bottom of the troughs are nailed, at right angles to the direction of the flow of pulp, 5 to 7 in. boards, inclined against the flow.

The pulp, diluted to at least 100 parts of water to one part of pulp, flows slowly over the edges of the cross boards to a depth of from 3 to 5 ins. The boards thus catch the heavier particles.

The rifflers should be made in so many partitions that one can be shut off for cleaning without interrupting the running of the rest of the mill. The slower the flow of the rifflers, and the greater the length, the better are the results obtained.

Care should be taken that the pulp flows evenly over the whole surface of the rifflers, and if this is not the case, and extra labour has to be used to keep the rifflers running properly, the service box should so rearranged that the pulp flows quietly, and in equal quantities and dilution over the whole length of overflow.

When washing out the rifflers, the pulp inlet should be closed, water admitted, and the knots and sand below the boards stirred up to allow the fibres present to flow off with the water. When all good fibres are washed away, the water is shut off, one side of the rifflers is raised, and the sand and knots hosed out into spouts alongside. This stock should not be sent to the refiner direct, but should be run over a small swift current rifflers, to separate the knots from the sand, pieces of brick from the digester lining, and other heavy particles.

There are other types of rifflers used, of which the author has found the following to work better and with smaller cost than any other, and to take comparatively small space. Two or more horizontal troughs about 3 ft. deep and of ample size, say for a 50 ton mill three troughs of 8 by 12 feet, built alongside each other with spouts for cleaning between. About 18 ins. apart are built vertical walls, so arranged that the pulp flows under one and over the next, and so on, in a layer at least 8 ins. deep. The sand and knots collect against the walls which go to the bottom of the troughs, and stay there. In case there are considerable quantities of rosin in the pulp, the walls under which the pulp flows should be provided on the side against the flow and at the surface of the pulp, with strips of soft machine felt 6 to 8 inches wide. These will collect the rosin. In these rifflers the flow of pulp is usually the same all over the width and they run for a week without any attendance. Care must be taken to stir the residue well and wash it well out with water before the rifflers are cleaned, in order not to lose any good fibre. These rifflers need, however, a much stronger support than the ordinary rifflers as their contents of water and pulp is several times as heavy as that of the ordinary rifflers.

The Screens.

There are two distinct kinds of screens, the coarse screen and the fine screen.

Coarse screens are either flat shaking screens with perforation of round holes of 3/8 to 1/2 in. diameter, or slowly rotating drums with the same perforation ,or perforated with oblong holes 1 to 1½ ins long and 1/8 to 1/4 in. wide, often arranged in the direction of the flow of the pulp in the rotating screen cylinder. They serve to take away knots and large slivers which otherwise would go on the fine screens and to some extent be broken up there. Care should be taken that the coarse screens are provided with strong shower pipes, and that the pulp is properly diluted with water, about 125 parts of water to one part of pulp, in order to make sure that no good fibres stick to the knots and slivers and escape with them.

Fine screens have been built on many different principles shaking, gravitation, water shock, suction, and centrifugal forces, but up till now a perfect pulp screen has not been devised. For the present the flat diaphragm suction and the centrifugal screens are dominating in sulphite pulp manufacture. For easy bleaching as well as for ordinary ''quick cooked'' pulp, the diaphragm screens are much to be preferred in spite of all their disadvantages, as they will sort out the larger part of slivers which in the cooking process have been softened, but not cooked enough to make the fibres separate in the blowing of the digester. In a centrifugal screen, these slivers will bend through the holes in the plates and follow the pulp. For strong pulp where the slivers are not cooked soft but remain in the unscreened pulp as stiff bundles of fibres, the centrifugal screen is much to be preferred.

The diaphragm screens are not cheap in first cost, if efficiency is taken into consideration. They need large space, are expensive in upkeep as to knockers and diaphragms, and the recutting of the plates is rather expensive.

Diaphragm screens should be arranged in rows of 4 to 8 with screen plates, horizontal or slightly inclined, in order to force the pulp to flow from screen to screen. Four screens can easily be coupled together and driven by one pulley, and even eight screens can be driven by one pulley if this is placed in the middle of the row. The pulp should be diluted to about 150 parts of water to one part of screened bone dry pulp. The pulp should run in on the first screen gently, not dumped down, in which case some of the slivers will be forced through the plates; nor rushed on the screens, when the efficiency of the first part of the first screen becomes nearly nil. The pulp on each screen should be circulated by means of spray pipes, or streams of water coming through flattened pipes, the current working nearly parallel with the screen plates, so arranged, however, that it helps the flow of the pulp from screen to screen.

The pulp outlet from underneath the screens should be so arranged that the level of the outflow can be regulated in order to make it possible to get the largest possible quantity of properly screened pulp from the screens.

Spouts leading the pulp from the screens should be as high as the frame of the screen to prevent an overflow in case the escape of pulp is diminished or stopped. The screen plates are cut according to the kind of pulp made, from No. 8 (0.008 in.) to No. 16, No. 8 to 11, are the usual cuts for bleachable pulp, No. 11 to 13 for quick cooked pulp, and No. 14 to 16 for strong pulp. Most European mills, where the chips are as a rule more carefully prepared, and the cooking is conducted more carefully, and where consequently the pulp contains less slivers, use screen plates as coarse as No. 14 for bleachable pulp.

In mills where several rows of screens are in use, the best way to get rid of the screenings is to place one screen at the end of the rows and lower than the rest, to which all the screenings are run. This screen should be provided with screen plates one to two numbers finer in cut than the plates for the rest of the screens, or at least new plates of the ordinary cut put on here first, before they go to the other screens. This lower screen should from time to time be shut off from the rest, extra water admitted, and run until the screenings are free from fibre, when water is shut off, pulp outflow levels lowered, and the screenings discharged to bin or truck, or direct to refiner, by removing one end of the screen frame and hosing the screenings out or by removing them with a wooden shovel.

Centrifugal screens are cheap in first cost, take small space, and are cheap in upkeep, even with regard to screen plates, but they take more power than the flat screens, about one and a half H.P., and one H.P. respectively per ton of air dry pulp in 24 hours. As before mentioned, they do not screen soft pulp as well as do diaphragm screens, but are the best screens for hard pulp. The types of centrifugal screens which collect the screenings, and throw them with a new supply of water against special finer perforated screen plates, are to be preferred, as they let the screenings out from the screens practically free from good fibres, The pulp should leave the screens diluted to from 275 to 325 parts of water to one part of pulp. Care should be taken that not too much pulp is admitted, in which case the screenings will carry away a considerable quantity of good fibres. Perforations used are round holes No. 50 to 65.

Screen plates, cut as flat screen plates with slots, have been proved to lower the output of the centrifugal screens to such an extent as to make them far from economical.

The screen room should preferably be arranged so that the pulp which mose from the blow pits goes to agitator chests, located below the screens, which can receive the pulp that may flow over from screens, or any other machine in the screen room. From the chests the pulp should be pumped to the rifflers from where it flows by gravity to coarse screens, fine screens and to agitator chests in the machine room.

In cases where the pulp is not blown into blow pits, but dumped or washed into open washing tanks, the pulp should by bucket elevators be taken from these tanks to a pulp disintegrator. The disintegrator usually consists of a conical c.i. or wooden drum, with a through going shaft, the shaft as well as the drum being provided with square pegs of ample size, between which the pulp is kneaded. These pegs should be so arranged that they work the pulp through the drum. Very little water should be admitted to the drum in order to get the pulp thoroughly kneaded, and only at the outlet end of the drum should water be admitted to wash the pulp to the rifflers.

The capacity of the diqerent machines in a screen room depends very much on the quality of pulp made. Disintegrators can and should be built to take the whole capacity of the mill, as this makes transportation arrangements for the semi-dry pulp cheaper. The size of the rifflers depends on the quantity and fineness of the materials that have to be separated out. The width for ordinary rifflers should not be less than 6 inches for each ton daily production, and the length should not be less than 30 ft.

Coarse screens are built up to a capacity of 30 tons in 24 hours. Twelve-plate 12 x 43 ins. diaphragm screens have a capacity of about four tons. Centrifugal screens are built in standard sizes for capacities up to 25 tons. The stock should be run into the stock chests in the machine room as thick as possible, and pulp thickeners should be used, particularly where centrifugal screens are installed.

The stock chest should be large enough to keep the department it feeds running for at least one hour, even if the previous department for some reason is shut down. Modern European mills often have stock chests large enough to feed their machines for as long as four hours.

The Machine Room.

As stated above, agitator chests should be provided large enough to keep the machine room running for an hour or more. The whole production of the mill is often dependent on the machine room, and it is cheaper, in first cost as well as in cost of labor, to have large agitator chests, than to have spare machines. The machines in the machine-room depend entirely on how the pulp is disposed of, whether used in own adjoining paper mill or shipped, and in the latt ercase whether sent to near-by mills or shipped long distances.

Guaging the Supply of Pulp.

Where the pulp is used in an adjoining paper mill, and the beater charge is mainly sulphite pulp, a large proportion of this pulp can be pumped direct from the agitator chests to the beaters. In this case the pulp should be thickened before it reaches the agitator chests, and preferably also between the agitator chest and the stock pump, to make it possible to pump as much as possible of the pulp. Where pure sulphite paper is made about 90 per cent of the stock should be pumped to the beaters.

For thickening the pulp between the agitator chests and the stock pump, pulp thickeners with false bottoms should be used, the false bottoms narrowing up against the cylinder mould from say ten inches at the inflow of the pulp to from two to three inches at the place where the thickened pulp overflows from the thickener; from here the pulp should flow to a small conical chest or agitator chest serving the stock pump. It is very difficult to determine with any degree of accuracy the amount of pulp pumped, in order to determine the yield in the sulphite mill, though several arrangements for this are in use.

The most reliable seems to be an arrangement with two measuring tanks so arranged that when one is filled it tips over and the other receives the pulp. From these tanks samples should from time to time be taken. An automatic counter should determine the number of tanks tipped for pumping.

The Product of the Wet Machine.

Ordinary wet machines should be used to take up the pulp for thickening the beaters. These wet machines should be provided with steel size rolls, preferably case hardened, and a scraper and inclined board should be provided to scrape off and conduct the pulp to the tanks; this latter to save labor, as one man can attend to four or even more machines. When the pulp has to be stored it should be cut off from the wet machines in laps, as they are easier to handle and give less loss in storage.

The lap from an ordinary wet machine contains about 33 per cent of air dry pulp, and where the pulp has to be shipped for a considerable distance, other machines have to be used to make the pulp fit for shipping. The laps can be pressed in a strong hydraulic press, say with 600 to 800 tons total pressure on the ram, and the laps pressed to up to 60 per cent air dry, but these laps give trouble in the breaking up in the beaters, and the fibre loses some of its strength in the breaking up.

It is therefore better and at the same time it saves labor to use hydraulic wet machines, though these have many disadvantages.

The ordinary kind of hydraulic wet machines give laps of from 40 to 50 per cent air dry pulp, depending on the machines as well as the temperature of pulp and water. The warmer the better; a good machine should not give less than 43 per cent in winter and 45 per cent in summer.

In cases where the pulp has to be sent long distances it will often prove cheaper to run the pulp over drying machines, but the fibre not only loses strength in the breaking up of the dry sheets in the beater, but is also to some extent burnt by the heat in the drying cylinders, specially if considerable steam pressure is used on the dryers, and these are of large diameter.

Wet Machine Equipment.

Wet machines should be provided with cylinder moulds of large diameter, not less than three and one half feet and preferably four feet or more. The cylinder mould frame is always made of acid resisting metal usually wound with copper wire of say 3-32 inches diameter, and with phosphor bronze wire cover of about No. 40 where the white water is well utilized, where this is not the case No. 60 or even No. 70 should bs used, but this lessens the output of the machine to a very large degree. Some times in order to lessen the strain on the top wire, a coarse phosphor bronze wire made of half round wire is applied between the copper wire and the top wire.

The machine vat should be provided with a false bottom which brings the pulp against the part of the cylinder mould going down into the pulp. Some water should be admitted in the opposite side of the trough, to prevent accumulation of pulp there, and should at the same time serve to dilute the pulp to suitable thickness.

There should be a strong spray pipe on the free part of the cylinder mould and to clean the wire a steam hose connection should be at hand, but care should be taken not to apply the steam jet through the pulp, this will blow pulp into the wire, and entirely spoil the wire cloth, as there are no means of dissolving the fibre blown into the wire. The packing at the ends of the cylinder moulds should be kept tight. The couch roll should preferably be covered with a rather heavy jacket, but can also be covered with old wet felts. The cover should neither be too thin nor too thick, and should be regulated to suit the pressure necessary on the couch roll catching the pulp. Too much pressure will spoil the wire cloth in a short time. The couch roll should be absolutely parallel with the axis of the cylinder mould, and placed somewhat behind the center of the mould. A considerably larger production can be obtained on the machine if the felt is so arranged that it to some extent presses the pulp couch roll. This will allow a thicker sheet to pass the couch roll without crushing it.

If the machine suddenly stops, shut off the pulp and discharge most of the pulp in the trough by an opening underneath the false bottom with the water on to dilute the pulp.

Start the machine with a small amount of pulp and put on more successively until the proper thickness of the sheet is obtained. Regulate the water according to the flow of pulp, too low a level in the trough is just as bad as one too high.

Suction boxes for felts are usually made of coarse grained hard wood, perforated with round holes and applied on a wrought iron suction pipe. These suction boxes, however, wear the felt quickly, and should be made of fine grained hard wood, for instance, mahogany, or still better entirely of copper, arranged with two rows of square holes so set that every part of the pulp passes the suction. The leading rolls on each side of the suction boxes should be so placed that the felt only presses slightly against the box, and the box should preferably be slightly rounded and the corners taken off. For the same reason the felt washers should be made of copper pipes rather than hard wood, and the felt should be well watered by means of spray pipes on both sides before it reaches the washer. The felt wringer should preferably consist of two rubber covered iron rolls as they will squeeze out the water with less pressure than wooden or iron rolls, and will consequently save the felts. The felt stretching rolls should not consist of wooden rolls with spirals of old felt or similar materials, as these spirals very quickly wear and spoil the felts, but should consist of copper rolls with half round copper spirals soldered on the rolls.

Hydraulic wet machines should preferably be provided with a one-piece fine grained hard wood press roll, but can also be provided with an iron roll covered with small pieces of hard wood placed on the end. These latter rolls, though cheaper, are very much harder on the felts. It is also harder to cut the pulp from these rolls and they do not produce as dry a pulp as the solid wooden rolls.

The hydraulic pressure to obtain the dryness of the pulp varies with the construction of the machine. It is usually 40 to 60 lbs. per sq. in.

To save the felts this pressure should be kept nearly constant by means of an accumulator, and where several machines are installed, one pressure pump for the whole lot with a spare pump and accumulator should be used, as this is more reliable and cheaper in first cost. The lower press rolls on hydraulic wet machines should preferably be covered with hard rubber in order to save the felts

Wet machines should be so set up that the pulp which necessarily collects under the machine should not come in contact with grease and dirt from the bearings and other parts of the machines, this in order to be able to send it to the white water tank and thus prevent it from going to waste.

Requirements in a Dry Machine.

A dry machine should be just as carefully arranged as a paper machine as to evenness of speed, flow and consistency of pulp. The consistency of the pulp in the agitator chest should be kept as even as possible. The pulp should, before it goes to the service box in front of the machine, pass through an automatic service box arranged with float connected to inlet valve, to secure an even level of the pulp and consequently an even flow. Where the agitator chest is located above the machine the pulp should be admitted direct to the automatic service box, but where the pulp is pumped from the chests there should be an overflow service box as well, with overflow back to the chest. The two or three service boxes can be built in one structure. The service box in front of the wire should be so arranged that the pulp flows on the wire slowly, and in an even thickness, and there should be arrangements to dilute the pulp here in a way that it reaches the wire well mixed with the water.

The wire should never be less than fifteen yards in length and No. 40 mesh or still better No. 24 double drilled. It is needless to say that there should be every convenience to change the wire and felts quickly.

There should preferably be three wet presses each arranged with double lever arrangements to get sufficient pressure. At the third, and preferably also at the second press, felts woven of coarse hard twined wool should be used, they will stand more wear and tear, will press the pulp dryer, and will give large felt marks in the pulp. The pulp should be run through the third press in the opposite direction in order to get felt marks on both sides of the sheet. These felt marks will collect steam, and thus make it easier for the steam to escape from the pulp, during the drying process, and less fibre will be weakened by too great heat when in direct contact with the drying cylinders. The process should be so strongly built and the counter weights on the levers so heavy that the pulp leaves the third press 42 to 45 per cent dry.

The Drying Cylinders.

The drying cylinders should preferably not be over four feet in diameter, specially for the latter part of the system, as the pulp needs some airing not to get burnt. The steam pressure in the drying cylinders should preferably not exceed five pounds and should never exceed thirty pounds for the latter part of the dryers not twenty pounds, in order not to burn the fibres too much. The drying surface of each drying cylinder should be utilized to its utmost capacity by means of two leading rolls for each drying cylinder.

To get the largest possible output from the machines, the flow of pulp should be regulated, not the steam pressure, which only should be kept inside a maximum limit by means of a safety valve. Care should be taken that the drying cylinders are freed from water as far as possible, in order to utilize the drying surface to the largest possible extent, as the steam radiates its heat more readily than does the condensed steam.

Steam traps which do not waste any considerable quantity of steam should be provided for every drying cylinder separately, or for small series of cylinders.

The very best steam trap is, where it can be conveniently set up, the old style trap consisting of a vertical iron pipe with an internal closed copper pipe connected to the outlet valve for the condensed steam, but there should be a large difference in diameter of the pipes, so that the inner copper pipe is affected by the hotter steam in order to close the bottom valve connected to it long before the steam has pressed all the water out of the traps, or a lot of steam is liable to escape with the water. The width of the sheet on the wire should be so wide that it nearly covers the whole width of the drying cylinders, and the ends of the drying cylinders should be well insulated in order to save steam.

Where exhaust steam is available, this should be used for drying the pulp, and when the mill is driven by steam it will often prove a good scheme to dry the pulp even in cases where the cost of freight is not very high, as the additional cost of instalment of the engine plant and the drying machine is not very high and the increased consumption of steam is only a small per cent.

It is preferable to run the pulp from the machine, with from 15 to 20 per cent of moisture, rather than air dry or dryer, as the fibres get more weakened by the heat from the cylinders the nearer they come to absolute dryness.

Preparations for Shipping.

Where the pulp is going to be shipped by rail it is preferable to roll it, as this takes less labor and still more lightens the work of the furnishing of the beaters in the paper mill, but where the pulp has to be shipped by boat, where bulk must be considered, it will have to be cut in sheets and baled.

The best baling presses are hydraulic presses with ample accumulators attached to the press pumps, in order to get the pressure up quickly. Automatic scales should be arranged on the press to avoid a double handling of the pulp. In selling sulphite pulp it is of very great importance to check the weight and dryness of the pulp leaving the mill. All customers will complain if they get under weight, but very few will say anything if they get too much pulp, and even a fraction of one per cent makes a large difference on the profit. All scales should be kept in perfect condition.

As to capacity, wet machines, with ample dimensioned moulds, should give 500 to 600 lbs. air dry pulp per inch, working width in 24 hours. Drying machines produce from 600 to 900 lbs. per inch working width in 24 hours; the most economical output as to steam consumption is about 800 lbs. One well arranged baling press taking three bales of 200 lbs. at a time, can handle up to 30 tons in 24 hours.

Screenings.

The screenings in a sulphite mill vary between 3 per cent and 8 per cent of the pulp produced, the quantity, depending on the kind of pulp made, the quality of the wood, and the evenness of the chips, and on the cooking. High quality bleachable pulp gives the lowest quantity, low grade strong pulp the highest quantity of screenings.

The right utilization of these screenings is of importance, as they are a waste, and consequently prices obtained are a net profit with the exception of the labor costs.

There are four kinds of screenings utilized:

Refuse from rifflers; refuse from coarse screens; refuse from fine screens, and refuse from extra fine screens, where two sets of screens one after the other are in use.

This last pulp, after disintegration has, to the author's knowledge, been offered here in Canada as a suitable sulphite for news print, but though unsuitable for this purpose, it is quite good enough for making medium grades of wrapping paper.

The other three kinds of screenings can either be run separately or mixed through the refining machines.

The Wahlstrom refiner has proved to be a suitable refiner for all kinds of sulphite screenings, and they can be run together, only the refuse from the rifflers has to be run over a small sand trap, to prevent stones from the digester lining and other heavy particles from going through the refiner

The best way to install a Wahlstrom refiner is to have a conveyor carrying the different kinds of screenings to the inlet trough, the screenings being much as possible freed from water.

The pulp from the refiner is mixed with sufficient water and run through centrifugal screens of say No. 40 perforation. The pulp going through the screen is run over a special wet machine, or thickened, and collected in an agitator chest, from where it is run over the wet machine or the drying machines at convenient intervals, preferably just before the cleaning out of chests, etc.

Refining Screenings.

The screenings from the above mentioned screens are once more conducted by an elevator to the main conveyor supplying the refiner. It is not a bad idea to arrange a small sand trap between the refiner and the screen. Screenings can also be refined in kollergangs, or in beaters, provided with basalt lava rolls and bed plates. In both cases is it essential to remove the sand and stones before the screenings go to these machines, and in order to save power and fibre to charge the different kinds of screenings separately. Wahlstrom refiners take more power than the other refining systems, but are cheaper in first cost, and one man can run a plant sufficient for up to five tons in 24 hours.

Kollergangs cost more in installation, and take more attendance, but cost less in upkeep. With basalt lava beaters it is possible to beat the screenings to a desired quality, but they need much attendance and a lot of upkeep.

Boiler Room and the Steam Raising.

Next to the wood room the steam plant is the most important part of a sulphite pulp mill from an economical point of view. Nevertheless it is often neglected, and often left in charge of men who do not even know the elementary theories of steam raising. Also the design is often left in the hands of men with insufficient knowledge.

The Lancashire boiler is undoubtedly the most suitable boiler for a sulphite mill, as its large water room makes it possible to vary the quantities of steam raised considerably, without too much waste of fuel. This type of boiler is, however, expensive, and so is its setting. The next best is the tubular boiler. The water tube boiler is cheapest in first cost, but should only be used in very large mills where the steam consumption is fairly even (sulphite pulp mill on the same steam main as paper and other mills), and where steam is the motive power.

All boilers should be set so that the combustion gases have few or no sharp turns or corners to pass, and the gases should, if possible, not be lead downwards, as this prevents the draught to a very large extent. The flames from the fuel should as much as possible be directed against the surface of the boiler, and for Lancashire and tubular boilers the setting should be a three way one, i.e., the gases should pass over the steam room of the boiler before they leave it, thus drying the steam.

Economisers preferably of the counter current type should always be employed. In plants where economisers are not used, the boilers are forced, and where there is sufficient draught available, an economiser can save as much as 25 per cent of the coal bill. In planning a new mill, the earning power of the economiser should not only be figured on the fuel saved, but also on the lower cost of boiler installation, as the heating surface of the boilers can be better utilized where an economiser is installed, and consequently the heating surface can be reduced.

The combustion gases should, for a plant without economisers, leave the boiler at a temperature not exceeding 450 deg. F., this in order not to waste too much of the heat; where an economiser of proper size is used, the gases can leave the boiler at a temperature of 600 deg. to 700 deg. F., the economiser utilizing most of the heat left, bringing the temperature of the escaping gases to about 300 deg. F.

The gases should contain at least 10 per cent, but never over 16 per cent of carbon dioxide CO_2). Where automatic stokers are used, the per cent of CO_2 can be kept steadily about 14 per cent, but by hand firing the percentage will vary a great deal. If the percentage of CO_2 is low, there is a surplus of unnecessary air in the gases, which is heated, and carries off a large amount of heat; when the percentage is too high, the combustion is incomplete, part of the fuel being converted into monoxide (CO) instead of CO_2 with an immense loss of combustion heat.

Automatic stokers should preferably be used, but of a design which allows for a large variation of the quantities of steam raised. An insufficient and uneconomical boiler plant has more than once proved to endanger the existence of sulphite mills, and an ample supply of steam, power, and water, are the most essential points for successful operation.

Without these in abundance, there is no possibility of showing good results, however well the rest of the mill is running and economies are looked after.

A NEW DIRECTORY.

The second English (1913) edition of "Paper and Pulp Makers' Directory of Sweden, Norway, Denmark and Finland," edited and printed by Hugo Brusewitz, Gothenburg, Sweden, contains the essential points of interest to manufacturers of three hundred and seventy-five mills, manufacturing paper, cellulose, board and wood pulp in the Scandinavian countries. Reproductions of the watermarks employed by the paper manufacturers, and an excellent map in colors, showing the distribution of the mills, add materially to the usefulness of this excellent publication.

Price Bros. of Jonquiere, Que., have opened up a permanent office in Toronto at room 712 in the Traders Bank Building, with John Hewitt, Jr., in charge.

W. J. Milford of the Winnipeg Paper Co., Winnipeg, intends opening a branch plant in Edmonton. Boxes of all kinds will be made and the plant will employ about fifty hands.

ESTABLISHING A PAPER MILL

By **DAN J. ALBERTSON**, Consulting Engineer, Kalamazoo, Mich.

The building of a new mill occurs but once or twice in the life of the average manager or superintendent, and to the man who has passed through and probably will not pass that way again, matters of construction will have but a passing interest. To the men who contemplate as nearly all assistant managers and superintendents do of "building a mill of their own," therefore, the article must be of value if to anyone.

This article will therefore cover other matters of probable interest to them in connection with the building and conclusions the writer has arrived at, an experience covering a considerable period of time both in the engineering and business end and association with some of the most able managers and paper makers of the period.

Organization

One of the first matters that is considered is—"who is going with you?" In the operating end congeniality is of great importance. The manager must manage and the superintendent superintend if you would avoid the petty jealousy and bickerings that so soon disrupt any organization in which they are present. An important item of the organization that is many times overlooked is the financial backing. This is as important as the paper machine. The fact that you have able men in operating and executive departments and money to build is not always sufficient. You require some banking or strong financial institution with established credit to lend stability to the young and untried company. Build up an organization. Do not be a one-man concern.

Location.

The location of the mill is an important step. Various municipalities offer alluring inducements by way of free sites and bounties. Beware, and consider well the location of a mill remote from paper making centres. An isolated plant has many handicaps that off-set natural advantages and inducements. Mills are not dependent upon local markets for raw stock or markets and are not competitors in the usual sense. On the contrary, the centralization of labor for mills is an advantage to all. Better locate in the midst of competition than alone with a limited market for your output.

Building

The question of building is governed, like many other items, by conditions. Some of the most successful companies have started in mills of the cheapest construction. It is this fact to which they owe their existence in part. Mill construction has made rapid advances in cost as well as methods during the past fifteen years. The development of the cement industry is accountable for this to a great extent. A combination of mill and construction appears to the writer to be best adapted, considered from all points. For stock, both raw and finished, finishing and all dry parts the timber construction has more points in its favor. First, it costs less, there is very little difference in the cost of insurance premiums if the risk is sprinkled, as the risk is based on the contents rather than on the building. It is cleaner and more flexible and adapted to changes. No coating has yet been devised that will entirely prevent dust and fine particles "wearing up" from the surface of concrete floors and causing annoyance.

In all wet parts I would advise reinforced concrete. This has advantages over the old combination of structural steel and concrete. In most places the beam method of construction has advantages over the mushroom or slab system, principally in the fact that the beams can be located underneath bearing points of machinery and each designed independent of the other for the load to be carried, the intervening space on which the load carried is usually light and can be flat floor slab of the thickness required. On large open spacing with light loads uniformly distributed the "mushroom system" has slightly the advantage in cost and appearance. The tile and concrete method is hardly adapted to paper mill use except in special cases.

Reinforced concrete has reached a point when the principles and design is understood by all up-to-date engineers and deformed reinforcing rods are rolled by all steel mills and sell in the open market at prices near the price of structural steel of same weight. With this standardizing of the construction it is not necessary to accept the alluring offers of the salesman with the "best" or "only correct system," who offers free plans and less material than any other, who will sell the reinforcing at "market" prices. This looks like easy money on the face, but in practice there are several drawbacks. You will get the plans usually well designed but without regard to anything except the safe-load. All the salesman-engineer is interested in is the sale of reinforcing. When the machinery is located and you will find a pipe running down through a beam or a belt through a column and have heard the sound of hammers and other tools of iron accompanied by cuss words(of user, not you) through the mill while these holes are being cut, it will not look as much like something for nothing.

Reinforced concrete under ordinary conditions and price will cost from 25 to 50 per cent. more than slow-burning construction, statements of the system salesman of the equal cost notwithstanding.

Power Plant

The power plant is one of the most important and misused parts of the mill and is many times carried to extremes, sometimes one way, sometimes another. It is safe to say that more money is lost or saved in the power plant than any other department of the mill. The superintendent being a paper maker, cannot be expected to be posted on the design and requirements. A knowledge of the requirements of a paper mill is essential to the intelligent design of the power plant. There are many eminent engineers whose practice is in installations, so large and complicated as not to be familiar with what is needed. On the other hand, there are efficiency engineers and power plant quacks who load up a plant, new or old, with a dozen or so of special appliances and frills, each guaranteed to save from 5 to 15 per cent. of the total cost of operation.

What is needed is a plant devoid of "frills," that will give continuous service and cause no trouble or shut-downs.

The question of mechanical and electrical transmission is one of the first problems to confront the designer. The arrangement of the mill sometimes settles this for him. The greatest economy of electric transmission is in intermitting service, outlying installations and direct connected units and ability to measure the power consumed. There is no disputing the fact that electric machinery is more complicated and expensive and requires more attention than mechanical equipment, or to reverse the comparison, if electrical equipment is given the same neglect that mechanical is, the results and economies would not be up to the same. From this analysis it would seem that if the arrangement of the mill will admit the driving of a line shaft like the beater line located on piers in the basement by a rope drive and from this shaft to machinery running continuously at full load it will be efficient runcause no trouble. It would also indicate that machinery located in remote parts of the mill can better run by motors either individually if large or in groups if small.

The question of an alternating or direct current is a matter open to discussion. The generating unit is the item that first influences this. The advantages of the direct current are the variable speed features for different purposes, including the paper machine and that the slower speeds are more flexible and better adapted to paper mill machinery. The commutator trouble and upkeep are against this style in comparison to alternating current. It is only adapted to very short transmission. The alternating current is adapted to long transmission and higher voltage. The upkeep is less and the motors cause less trouble. They are popularly alluded to as "fool-proof" or "simple as a sawbuck," which is not true. As a class the speed is higher. They inherit power factor trouble which, while it does not affect the motor or running, necessitates greater outlay in generating investment. Motors of this class should not be run continuously underloaded for this reason.

This brings me back to the prime movers or steam engines. I will discuss the producer gas plant briefly by mentioning that gas engines have reached a higher point of design and efficiency than the producers. In the use of soft coal in producers it necessitates scrubbers and purifiers that lead to complications, and while the producer gas plant in theory is a very efficient equipment, still, at the present time, considering the amount of steam used in paper mills and allowing for the hot water from jackets of gas engines, it ought to be gone into very carefully before even considering the installation. Oil engines may be disposed of almost as briefly. The recent high price of oil has effected these installations seriously. There is no question regarding the extreme high efficiency of these engines or their adaptability as auxiliaries. One of the serious items is the upkeep and tinkering required. The cost of the foreign engines much exceed the domestic machines and it is questionable whether the domestic engines can compete with them in quality owing to the higher cost of American skilled labor. The use of steam in paper mills is also an item effecting these engines.

This brings me back to the old stand-bys, the steam engine, either in the simple, compound or turbine types. The turbine is best suited for large installations of the alternating current type, and it is not efficient except running condensing with high vacuum. The taking of steam from between the stages is advocated by some and figures out well, but in practice is open to discussion. High initial pressure and super-heat aid the efficiency of the type. It is only adapted to direct connected generators. It is very economical as to space required. In comparing the steam consumption with reciprocating engines, care should be taken to see that the steam consumed by the auxiliaries is included, as these are usually steam driven and very inefficient.

To take up the other type, the simple engine should be installed up to the limit of the continuous consumption of the exhaust steam. A simple engine is very inefficient from a thermal standpoint. The number of B. T. U.'s extracted is very small and consequently the steam less the radiating losses in the cylinders, etc., is practically as good after leaving the engine as the same amount taken from the boiler. The proportioning of this unit is governed by the individual conditions either a unit driving a generator for the electric equipment, or a variable speed engine for paper machine, or both. There is no economy in steam pressure in this engine exceeding 100 pounds. This leaves but one type left, the cross compound condensing, or in board mills the twin cylinder or non-condensing type when using exhaust steam. This can be either mechanical or direct connected electric, as the case may be. The initial steam pressure will be between 150 and 175 pounds. The vacuum should not exceed 26 inches, as the economy of the engine is not increased in proportion to the cost beyond this. The speed of this should be from 85 to 100 R. P. M. for Corliss type. Other types of engines are modifications of the above and need not be discussed.

From an analysis of the above it would appear that for an electric plant, considering cost, etc., a turbo-generator, with variable speed reciprocating engine for paper machine. For a direct connected mechanical electrical plant, a cross compound condensing engine driving line shaft by rope drive, with twin or quadruple cylinder variable speed engine for paper machine, suitable engine driven or belted generator as the size of plant required.

Regarding the boiler plant, standard water tube boilers are to be preferred. There are several on the market. When the total operating horse-power reaches near 1,000 horse power or above, automatic furnaces should be installed. In installing furnaces the kind of coal, whether of the coking, semi-coking, or free burning coal should be considered. This item is the rock on which breaks the reputation of stokers many times where one owner will say they are good and another bad.

As the plant increases in size coal and ash handling devices should be considered. In the small or medium plant the man with the wheel barrow is the cheapest investment. Ash handling should not be attempted with bucket conveyors, as the upkeep is very great. This type is satisfactory for coal handling of moderate size and the coal lubricates rather than wears the joints. Where large storage and great capacity is desired, the grab-bucket, bridge crane, telfor and mono-rail or locomotive boom will reach the limit.

Economizers aid the efficiency of the plant in coal consumption. Super-heaters increase the theoretical efficiency of the engines by the delivery of dry steam. For reciprocating engines the super-heat should be below 100 degrees. When built into the boilers they detract slightly from the efficiency of the boilers. These may be included as "frills" or items that perhaps show slight net returns after the investment is considered and the risk of them not being run as de-

Equipment

The equipment of a mill depends so much on the product that but little by way of suggestions can be offered. The principal caution would be to arrange that the units should be harmonious as to size and not compel the over-working of any particular part. Few if any machines are more efficient either in output or power by over-loading.

Layout and Design

In designing and laying out a mill the plan is sometimes influenced either by the size and shape of the site or by an original plant. In case there are no handicaps of this nature, the arrangement will depend on the incoming railroad sidings, care being taken to provide for incoming and outgoing stock and coal. With a combination of mechanical-electrical or all electrical power, the arrangements of departments are flexible only having in mind the ruling or inexorible law that all stock should follow a continuous route and should not retrace over any part of its passage from the time of entering the stock house to the loading out at the other end. Also that all material like clay and size used in the process should be made and supplied at the psychological moment and in proper sequence without being brought from some remote place conflicting with the routine passage of product.

It is advisable to place the beater room at right angles to machine room, with power plant centrally located for short transmissions of steam and power. In case of mechanical power the engine room should adjoin the beater room. The placing of engines in basements of other rooms in a mechanically driven plant is not to be commended as a general proposition, although sometimes necessary.—Paper Trade Journal.

THOUGHTS ON PAPER DRYING

By JOHN W. BRASSINGTON.

The compartive lack of knowledge of the details of the operation of drying paper on a paper machine makes this subject one of absorbing interest to anyone desirous of improving the art of Paper Making. There is, generally speaking, comparatively little attention paid in the design of a paper mill, to the advisability of making special arrangements so that the dryers will be provided with an ample steam supply at every dryer, with an abundance of dry air and with an efficient water-discharge system. It is probable that this apparent indifference to what is, as a matter of fact, of prime importance, is largely due to the prevalent ignorance as to the amount of water that is evaporated from the paper at each dryer, as the paper passes on its journey from the presses to the reel. Ignorance of the percentage of the total drying work that is done by each dryer argues an equal lack of knowledge of the amount of steam that must be supplied to each dryer in order that it may be enabled to do its allotted share.

It is not convenient or practicable for the average mill to lose time and output by making experiments in order to obtain information as to the consumption of steam by each dryer. Such experiments must, of necessity, be expensive and costly in both time and money, and the advantages that might be obtained by making them are not very evident to the average paper maker. It is, however, more than probable that the efficiency and capacity of every paper machine might be considerably improved could we be certain of the best method of distributing the steam supply in a nest of dryers.

It is possible that the reading of this article may excite the interest of someone who will make an effort to obtain definite information on this subject; a suggestion to some virile minds is equivalent to action, should they approve of the idea advanced for their consideration.

The steam header, that supplies the steam to the various dryers generally, is furnished with exhaust steam from the engine driving the paper machine, being further supplied, if necessary, with an automatically controlled supply of high pressure steam from the boilers. The supply of steam to the main header could be turned into it at either the calendar or at the press end of the header, or it could be furnished at one or more intermediate points. Again, the steam header could be divided into sections each with its individual supply of steam, in such a manner as to maintain a pre-determined and separate pressure in each section, proper pressure relief valves being installed so as to relieve the atmosphere or to any adjacent section subjected to a lower working steam pressure.

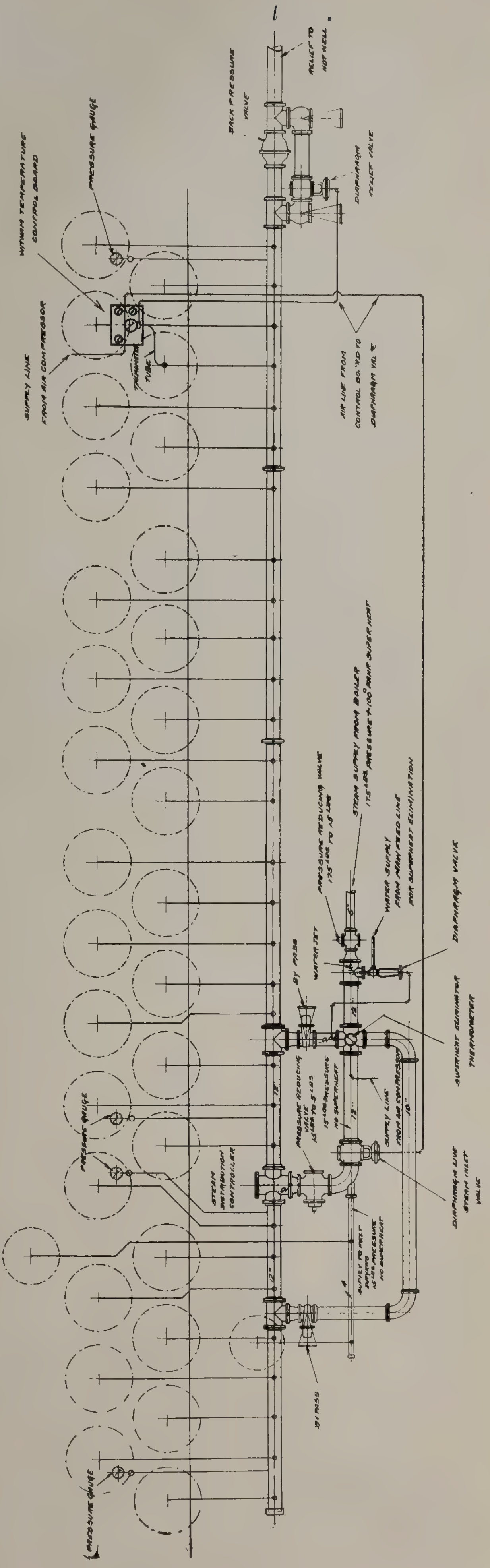
If the steam is supplied at the calender end of the steam header, then it is evident that the highest pressure and temperature would be maintained in the last dryer at the calender end, while the lowest pressure and temperature would be maintained at the first dryer at the press end. This method may be calculated to secure a high degree of economy of steam, even if a corresponding loss in the capacity of the dry part be the result of its adoption. The entrance of live steam at the calendar end of the steam header has the disadvantage of keeping the dryers at this end too hot, in order to obtain a sufficient supply of steam to satisfy the demands of the header as a whole. It is axiomatic that wet paper cannot be injured by high temperature end, without injuring the paper, and for this reason, until it is deprived of its protective moisture; it is, therefore, possible to maintain a higher pressure of steam, and therefore, a higher temperature at the press end of the dryer nest, as compared with the calender it is at first sight advisable to make the steam enter the dryer header at the press end.

Now it is one of the laws of heat transference that the amount of heat passing from one body to another in any unit of time, is directly proportional to the difference in temperature that exists between the two bodies during that unit of time; it is, therefore, evident that, providing our paper contains moisture, when leaving any dryer, the quantity of efficient drying done on the paper by that particular dryer as the paper moves over it, is the greater the higher the pressure and temperature of the steam in the dryer. Moreover, the greater density of the steam, as it enters the dryers, owing to its higher pressure, permits of a larger supply of heat per unit of time. Broadly speaking, a dryer nest is the more efficient the higher the steam pressure in the dryers at the press end, and the lower the pressure and heat in the dryers at the calender end; the drop of pressure or heat between these two points being as uniform as possible.

It is evident that if we select and install our piping so as to feed the steam in the main header at such a point between the two ends as to supply in both directions an equal quantity of steam, then the size of the piping required is reduced to an economical minimum; should this arrangement be made, it were probably best from the considerations mentioned above to arrange for the introduction of any "make up" live steam that might be required at the press end so as to increase as far as possible the capacity of the drying unit. Live steam suddenly reduced to a lower temperature, has a tendency to become super-heated; for instance, steam at 150 lbs. gauge pressure contains 1195 heat units per pound; when a pound of steam at this pressure expands to a pressure of say about 5 lbs. gauge, it only requires to contain 1155 heat units to maintain the new condition; the remaining 40 heat units thus released, use their energy in super-heating this steam. As the specific heat of super-heated steam at five pounds gauge pressure is about .48, then it is evident that each pound of steam released from 150 pounds gauge pressure into a dryer header at five pounds gauge pressure, becomes super-heated about 80 deg. F. This compartively small amount of superheat is soon destroyed by the presence of any moisture in the steam header; but if the steam from the boilers, as is often the case, is already super-heated, it is then well to arrange for the eradication of superheat by some mechanical means. The accompanying illustration is a fair example of the care with which such a contingency is taken in hand in an up-to-date installation.

It is probable that the difference in the pressures maintained in different dryers in the same nest is very large; the demand for steam that exists in the first few dryers is probably often large enough to cause a partial vacuum in them; in some cases, if the steam pressure is high enough to keep the first dryers supplied, then the work done by them may be excessive enough to harm a heavily loaded paper. The efforts made by many drying experts to improve the efficiency of any given nest of dryers by the installation of special dippers, individual valves, individual steam traps, vacuum pumps, etc., have always met with some greater or less degree of success, because it is a rare thing to find a dryer unit that is not susceptible of improvement. Any improvement made on the average paper machine dryers that too often are suffering from plugged syphons, broken dippers, poorly designed and installed piping, or miserable ventilation, that, therefore, can be made by almost any device, will naturally show very decidedly not only in the saving of steam, but also in the quality and finish of the paper. Any paper maker can probably obtain a great deal of enlightening information, if he will place pressure gauges in the steam header at different points or preferably on the water outlet pipes. While a live steam line, feeding into the header at several points, with hand controlled valves, together with valves in the steam header that are partially closed and so control the steam distribution in the header, would give the investigator an opportunity to make experiments that probably would result in not only a greater capacity, but also in a greater economy of steam, together with a better finish on the paper.

A periodical examination of the interior of the dryers, in order to keep the water eradicating apparatus in good shape, as well as to clean out any oil that might accumulate, will more than pay for the cost of such a procedure. The use of a good design of syphon, with a reliable trap on each dryer cylinder, on a book machine, is an unbeatable arrangement, providing the apparatus is kept at all times in good working order, but even this refinement is not always perfectly successful, if the steam supply to the dryers is not ar-


RELIEF TO HOT WELL
BACK PRESSURE VALVE
DIAPHRAGM RELIEF VALVE
PRESSURE GAUGE
WITHIN TEMPERATURE CONTROL BOARD
SUPPLY LINE FROM AIR COMPRESSOR
THERMOMETER TUBE
AIR LINE FROM CONTROL BO'RD TO DIAPHRAGM VAL'E
STEAM SUPPLY FROM BOILER 175 LBS. PRESSURE + 100° FAHR. SUPERHEAT
PRESSURE REDUCING VALVE 175 LBS TO 15 LBS
WATER SUPPLY FROM MAIN FEED LINE FOR SUPERHEAT ELIMINATION
DIAPHRAGM VALVE
BY PASS
WATER JET
6"
12"
SUPERHEAT ELIMINATOR THERMOMETER
PRESSURE REDUCING VALVE 15 LBS TO 5 LBS
15 LBS PRESSURE NO SUPERHEAT
SUPPLY LINE FROM AIR COMPRESSOR
10"
DIAPHRAGM LINE STEAM INLET VALVE
STEAM DISTRIBUTION CONTROLLER
SUPPLY TO FELT DRYERS 15 LBS PRESSURE NO SUPERHEAT
PRESSURE GAUGE
BY PASS
PRESSURE GAUGE

ranged so that each dryer is supplied at all times with ample steam at the pressure most suitable to it in its position in the nest. Ideal drying conditions are, of course, rarely obtainable in practice, yet it is quite possible that a little care may, in many cases, help towards a partial realization of them.

On a modern high speed news machine, it is essential that dippers of efficient design be used; at a speed of 600 feet per minute, the dipper must be balanced, it must be of such a design that the influx of water will not trap steam in it; the area of the dipper outlet must equal the area of the dipper inlet at the moment of operation. With dippers in the dryers, it is probably unnecessary and possibly harmful to use a trap on each dryer, because traps are liable to work badly when receiving intermittent slugs of water. One good large trap on the water discharge pipe that serves all the dryers is generally successful with a nest of dryers supplied with dippers; the reason for the opinion here expressed, that a trap on each dryer is a good thing with a syphon installation, is that under the average conditions, with the steam header open to all the dryers, with no attempt ta the intelligent control of steam distribution to each dryer, then there must be a different pressure in practically every dryer ranging from the highest pressure in some, equal to that maintained in the steam header, to a partial vacuum in those dryers that are doing the most work. As a syphon depends on the pressure on the dryer, or rather the difference between the pressure in the dryer and in the water pipe for its operation, it is evident that the presence of a steam trap may permit a dryer to get rid of its water by syphon action, when the syphon would not work should the trap be removed. The dipper action is purely mechanical and practically independent of the pressure in the dryers; therefore, it is probable that the fewer obstacles to a free discharge, the better.

Referring to the illustration, it is noteworthy that more than one pressure gauge is shown, in order to give a measure of the distribution of the steam supply; this is evidently a long step in the direction of the obtaining of definite information as to the action of a nest of dryers in a paper machine.

As the necessity for economy in operation becomes more urgent, so more attention will be paid to such problems as we have discussed in this article; it must be remembered, however, that the more complicated the apparatus becomes the greater is the skill demanded in the operation of it. Complication of apparatus brings its own troubles, and they are always multiplied tenfold if there are any parts in the mechanism that require delicate adjustment. Thermostat valves on steam traps are often put out of commission by a small flake of rust, and the machine tender, or even the superintending mechanic, rarely knows or cares whether a trap is in good condition or not.

To illustrate this great handicap under which the newer apparatus that is trying to get a foothold in the Paper Mill has to labor under, the writer is personally reminiscent of one case where a large and expensive ball bearing was taken apart and put together again by some first-class mechanics who afterwards piped up the automatic oil feed to the bearing with small pipe, which small pipe they forgot to clean thoroughly after cutting and fitting together. The consequence was that a few flakes of iron from the cut pipe got into the bearing and put it out of commission in a few weeks. Another bearing of similar design would run indefinitely if nothing untoward like the above occurred.

Doubtless, many mill owners have experimented and spent good money on vacuum systems, traps, etc., on the dryers, only to find their money gone for nothing but a large addition to the scrap pile; such disheartening experiences are quite as often due to an apparently insignificant oversight, like an omission to clean the interior of the pipes, as they are to any failure in the original design.

In conclusion, it is well worth noting that the amount of power required to drive a nest of dryers can be increased possibly fifty per cent. if the steam joints on the dryers are made up too tight. It is, of course, necessary to make up some designs of steam joints as tight as they can be made up, in order to stop their leaking. It is certain, however, that if the mill owner found the cost of keeping such joints tight, expressed in dollars and cents, spent to supply the extra power to drive the nest of dryers under such conditions, that he would then soon cast around for a more economical design.

A DEVELOPMENT IN CEMENT PROCESS.

The Gun-crete Company has opened its new offices in the McCormick Building, Chicago. This firm specializes in Gun-crete Work for Engineering, Mining and Industrial Structures. It has at its disposal a large amount of the most modern Cement-Gun equipment and a very efficient working organization.

The Gun-crete Process is especially valuable for water and fireproofing purposes, for the encasing of steel structures, for rust and fire protection and for the lining of tanks, reservoirs and numerous other purposes. By overcoating with Gun-crete, temporary structures can be cheaply transformed into sanitary, permanent buildings.

Mr. Carl Weber, the president of the Gun-crete Company, is undoubtedly one of the best known concrete engineers in America. He is the inventor of the reinforced concrete chimney of which thousands have been built in this and foreign countries, and has designed and built a large number of other important engineering structures. He has been connected with Cement-Gun operations for some time and is considered to be one of the leading experts in this kind of work.

NEW U. S. REGULATIONS REGARDING IMPORTS

The Treasury Department at Washington made a ruling to facilitate the importation of paper at the lowest possible rate of duty.

Under the retaliatory provision of the paper schedule in the Underwood Tariff Act, regulations were drafted requiring the importer to disclose the name of the manufacturer and the place of manufacture of the paper, so that the customs officials might be able to tell whether the paper was entitled to the lower duty. In the case of an importation of paper by the Perkins-Goodwin Company, which for trade reasons did not wish to disclose the names of the manufacturers, the Treasury Department ordered that the name of the manufacturer in this and similar cases be waived.

Customs officials were directed to accept instead the affidavit of the importer as to the place of manufacture of the paper and the province of origin of the wood from which it was made.

Mr. John S. Bates, the new superintendent of the Dominion Forest Products Laboratory has arrived in Montreal, and will proceed with the plans for the institution of tests on Canadian woods.

CANADA'S FOREST RESOURCES

President of Royal Society of Canada Speaks in Montreal.

On Tuesday evening, May 26th, before a large assembly of members of the Royal Society of Canada and guests, Dr. F. D. Adams, dean of the faculty of Applied Science at McGill University, and president of the Royal Society, delivered his address as head of that body on "The National Domain in Canada and Its Proper Conservation," in the new medical building of the university. The address was comprehensive, embracing the natural resources of the Dominion—agricultural and the cattle trade— forest products, timber, pulpwood; water powers, products of the mines; fisheries and the fur trade.

Particular emphasis was laid upon the forest as a producer of wealth and a source of permanent prosperity. Dean Adams said that—

The forests of Canada were its chief source of revenue in the early days of the settlement of the country. Year by year the great rafts of timber were floated down the St. Lawrence and Ottawa rivers past Montreal and were loaded on fleets of ships at port of Quebec. Later, with the advent of railways, the same lumber was brought in immense quantities by rail to Montreal or shipped directly to its market in the United States. The following table shows the total forest products of Canada for census years, going back to the year 1871, expressed in cubic feet:

1871	1,386,122,654
1881	1,999,544,178
1891	6,955,024,616
1901	4,762,235,878
1910	2,084,000,000

Notwithstanding this continuous drain upon our forests and the tremendous losses which they have sustained by fire, the general opinion of the people of Canada, an opinion to which from time to time expression is given in the utterances of our public men, is that the great northern forests of Canada are so extensive that they are practically exhaustless and will afford an abundant supply of timber for all future time, a supply which will not only meet our own needs, but will be amply sufficient to make good the increasing demand of the United States, due to the disappearance of its own forests, and also afford a surplus for export to Great Britain, South America, the West Indies and other countries as at the present time. A closer examination of the facts of the case obtained by investigations carried on during recent years, however, reveals a number of interesting and very important results.

Mr. Adams exhibited maps prepared by Mr. James White, the Dominion geographer, showing the sparsely wooded areas, the northern forests densely wooded, the southern forest, cleared forest, prairie, British Columbia forest and forest reservations. Then he proceeded:

It is only in these portions of the Dominion which are shown to be covered by the "southern forest," the "northern forest, densely wooded," and in British Columbia that there are forests yielding merchantable products. Furthermore, it must be noted that the "northern forest" is composed chiefly of trees of less value than the "southern forest," which has up to the present time been the chief source of the timber supplies of Eastern Canada.

A careful study of the question by the Dominion shows that so far from being exhaustless, the reserves of merchantable soft timber in the forests of Canada are only between one-quarter and one-fifth of that remaining in the forests of the United States. Of these reserves in Canada, about one-half is in the old provinces of Eastern Canada and the other half in British Columbia. The evidence goes to show that at the present rate of cutting the supply of timber will within a comparatively few years be sufficient only for the needs of the Dominion itself, leaving no surplus for export.

Effect of Cutting.

It must be borne in mind that while a large part of Canada is covered with forest, much of this is a woodland country rather than a country covered with a forest which produces considerable supplies of merchantable timber. Furthermore, the practice which has been followed of cutting out the valuable kinds of timber has left the successively poorer and inferior species of trees—"tree weeds" as they have been called —to multiply without restraint, and thus the forest gradually changes its character and deteriorates in value. Moreover, the rivers draining the northern forest flow down to Hudson's Bay, so that the logs if floated down the streams would reach that body of water instead of the St. Lawrence. With the approaching exhaustion of the reserves of standing timber, there has sprung up within the past few years a demand for pulpwood to supply which the younger and smaller trees are taken and ground up for the manufacture of paper. Fortunately this is not necessarily so fatal to the continued existence of our forests as might be supposed, for the younger trees, if properly cared for, grow in a relatively few years to the size required for pulpwood. Thus, if the limits over which a company cuts its supplies are large and properly cared for, they can be made to produce a continuous supply of wood for the pulp mill. Our great water powers adjacent to the supply of raw material should make this pulp and paper industry a permanent source of wealth to the Dominion.

Dr. Adams next reviewed the work done in other countries for the maintenance of the forests and proceeded:

In all the European countries and in India the forests are owned in part by the State, in part by the municipalities or communes and in part by private persons. The forests owned by the different German states represent about 33 per cent of the total forest areas, while in Russia the Government owns 62 per cent and in Sweden 35 per cent of the forests. Speaking generally, it is found that the State-owned forests are the best, most efficient and most productive. State ownership is the most suitable owing to the long time —60 to 120 years—which is required to bring the depleted forests into a permanently productive condition, which naturally discourages private enterprise. Since most of the forests in Canada are owned by the governments, it should be a comparatively easy matter to change our present methods of dealing with our forests and replace them by much more efficient ones. Only two reasons for hesitation can be put forward—firstly, that any change may interfere with private operations, and secondly, that the expense entailed would be very great.

In reply to these objections it may be said that there are now enormous areas of land which are at present standing waste, that is to say, they are either destitute of trees or growing trees which are of no value. If the governments were to secure certain of these areas and establish forests on them by following the well-known principles of forest practice worked out and proved to be so efficient and effective in every country in Europe, they would not only be establishing a profitable investment for public funds but would present to private owners a striking example of what can be accomplished by the application of knowledge of industry. We are assured by a forester of no less experience than Dr. Fernow that with the present stumpage of white pine in Canada, the cost of planting can be covered and a return of at least 4 per cent compound interest could be obtained, while other kinds of wood are fast reaching a value which would well repay the cost of reproduction. Such forests of choice pine or other woods, which are each year becoming more difficult to secure, would seventy-five years hence be of enormous value both as a source of revenue to the Government and of wood supply to the people of the country.

Forests and Streams.

But in addition to supplying timber, the forests of a country play two other very important roles, namely, that of equalizing the flow of rivers and the preservation of the land itself from being washed away in times of heavy rain. Beneath the trees of a forest a thick mantle of leaves and twigs covers the ground. These rest upon humus produced by the decay of leaves which have fallen in former years and which is very porous. This material, sheltered from the sun in the shadow of the forest, is like a sponge which is capable of absorbing several inches of rainfall, which is allowed to escape only very gradually. When, therefore, the forest cover is preserved on the gathering ground or catchment-basin of rivers, the rain falling on this forest area drains away very slowly into the brooks and streams, which tends in a very marked manner to equalize the flow of the rivers and to lessen the danger of floods.

To protect some of our more important streams of our Dominion (or provincial) governments have, on the recommendation of the Commission of Conservation, set aside certain large areas about their head waters as permanent forest reserves or national parks. The total area of the Dominion forest reserves at the present time is 35,804 square miles, and the total area of national parks in Canada is 4,114.5 square miles. In the forest reserves no land can be taken up for settlement, and the forest cover will be permanently preserved, while in the national parks the game is also preserved, so that they become sanctuaries for the wild animals of the country. One of the most important of these forest reserves is that on the eastern slopes of the Rocky Mountains in Alberta, which will not only protect the catchment areas of the rivers flowing through the great plains but will also supply timber to the future population of this great district. This action of the Government is worthy of all commendation. Other reserves should be added to those which have been already set aside, as, for instance, the tract about the head waters of the Winnipeg river recently recommended by the Commission of Conservation, the area being one which is unfit for settlement but of great importance in connection with the equalization of the flow of this river on which such enormous water powers are now being developed and which have such an important bearing on the welfare and future of the province of Manitoba.

Felt Manufacturers Tighten up

(Special to Pulp and Paper Magazine)

New York, N. Y., May 25.

The Felt Manufacturers Association recently sent a new classification of the stock required by felt makers, to the dealers in rags and paper mill supplies.

The classification contains a long list of material which can be used, and a parallel list of the things that cannot be used in making paper.

There have been differences of opinion between the dealers and manufacturers regarding the value of certain stock in the past. Dealers however are only too glad to get good stock to the mills, but they sometimes have difficulty in securing such material from packers. Some of the packings sent to mills have contained large weightings of filth, old hats, bottles, bricks, kettles, tin cans, gum-shoes and even old boilers. It has never happened according to persons familiar to mill rejections, that wood cuttings, copper wire or copper bottomed kettles were sent in the raw consignment. Dealers have been inclined to plead ignorance on the part of the practice. But the fact that there is never a consignment carrying waste materials of any value seems to contradict this.

In order to get some better arrangement for packings, the mills decided to reject all material not up to classification. This right they assumed in their notice to the dealers, which is as follows:

"Rugs and all materials purchased on this order are guaranteed by the shipper to be dry and free from rubbish or any materials unsuited for making paper or felt, and when received, are subject to mill report as to weight and grading. Rags and all materials containing moisture or trash will be, at our option, subject to rejection, or if such stock be accepted, it will be at a reduction for outthrows and moisture, plus the freight on outthrows and moisture, with an additional $5 a ton deduction on actual weight of outthrows sorted to cover expense incurred in sorting.

All waste materials to be disposed of by us.

Your acceptance of our order constitutes an agreement to the above terms.

We reserve the right to adjust any irregularities against subsequent shipments."

These terms which appear at the end of the felt makers' classification stirred some activity in the paper mill supply dealers and the Associated Dealers in Paper Mill Supplies of New York held a meeting on May 13 to discuss the question. J M. Richardson, president of the Felt Manufacturers' Association was present and gave a brief outline of the operations of the manufacturers. He said that they were willing to co-operate with the dealers in bringing about satisfactory terms. As a result a committee was appointed to take up the question with the Felt Manufacturers.

Terms were somewhat modified by the dealers committee at a meeting held a few days ago. This suggested reading of the classification is satisfactory to several of the manufacturers and it is belived will be recommended by the executive committee of the felt makers organization to the mills.

UNITED STATES NOTES

(Special to Pulp & Paper Magazine.)

Daniel Lewerth has a habit of going it alone in all his business ventures. In the case of The Paper House of New England, of Springfield, Mass., he has bought out the other interests and has assumed personal charge of the entire business. The preference of the buyer for mill-marked, advertised printing papers has been clearly shown in the steady progress of the Paper House sales. Mr. Lewerth's plans for further development include bringing his New York house, Andrews & Lewerth, Inc., and the Springfield houses closer together. E. P. Archibald will be sales manager, and chief assistant to Mr. Lewerth in extending the company's business.

Continued rainfall in Wisconsin has sent water levels hereabouts even higher than they were a week ago. At the present writing there are five bays open in the middle dam, a condition that has not been seen here for several years. There no longer seems any likelihood of low water conditions prior to the normal water famine season, which usually sets in about the latter part of June and continues six weeks to two months. Mills in this valley are getting all the power they need.

A deal has been closed whereby the Wisconsin Tissue Paper Co. of this city, secures a lease of fifteen horsepower of water power and riparian property of the Green Bay and Mississippi Canal Company. The Tissue Company intends utilizing the water power for power in its plant and on the land, comprising about two lots, the company will build storage sheds for stock. On the property at the present time is located a three-story frame building constructed some time ago for the Appleton Excelsior Company. The structure will be dismantled at once.

All the paper from now on that is used by the city government of Kalamazoo must be paper made in Kalamazoo. The council at its last session adopted a resolution calling upon all of the different city departments to insist hereafter that nothing besides paper made in Kalamazoo be used in city business. During the course of a year the city uses a large amount of paper of various grades, and while in the past a very large percent used has been Kalamazoo made paper, from now on itmust be produced in Kalamazoo mills. Even concerns which bid on city printing must specify in their bids that the paper they will use is produced in some Kalamazoo mill.

The Union Paper and Twine Company, of Detroit, Mich., has purchased the factory building at the northwest corner of Fort and St. Antoine Streets, the consideration being about $100,000, it is understood. The property has a frontage of 343 feet on Fort Street and is 130 feet deep. The paper concern will spend about $25,000 in remodelling the structure for use as a plant.

The Bemis Brothers Bag Company, of 612 Fourth Street, South, Minneapolis, Minn., has begun erection of a seven-storey addition to its plant. The addition, according to C. B. Simmons, one of the managers, is made necessary by the State labor laws limiting the hours of labor for women. "We have to use more help on account of the new labor laws, and we have to have more space in which to work as a result," said Mr. Simmons. The annex will cost $30,000.

The Ashuelot Paper Company at Hinsdale, Mass., is about to construct four tenement houses near its mill on the Ashuelot road. The houses will be placed on the brow of the hill north of the road, and will be attractive, but not particularly expensive. The houses will be for the accommodation of the employees of the mill and thus save them the mile walk to the village daily.

The American Box Board Company is putting in foundations for buildings to duplicate its present paper mill at Grand Rapids, Mich. The paper mill building will be 275 x 60 feet, and the beater room 80 x 175 feet, two stories. The new buildings will be adjoining the present buildings on the west. Rapid progress is being made on the manufacturing plant across the street from the paper mill, which will be 465 x 200 feet, three stories.

The trial of the suit of Vinton A. Hogan, of Lewiston, against the Great Northern Paper Company, was begun last fortnight in the Supreme Court at Auburn, Me. In this case, the plaintiff seeks to recover as a result of an accident in the mill of the defendant corporation at Millinocket, June 16, 1913. W. H. Judkins is counsel for the plaintiff and Newell & Skelton for the defendant.

Announcement was made last week of the resignation of Joseph H. Eilers as manager of the Lockport, N.Y., branch of the United Boxboard Company. Timothy J. Neville, a Lockport man, who has held responsible positions as superintendent of boxboard mills at Wilmington, Ill., and Franlin and Urbana, O., for the last three years, succeeds Mr. Eilers. Mr. Eilers will not make known his plans for the future. He says he is considering a number of good offers. Mr. Neville was employed in various capacities at the Lockport branch before going west, and has a large circle of friends in Western New York, who will be pleased at his appointment.

Three men were killed and a number seriously injured by an explosion of dynamite being used by log drivers to blast ice near Northwest Carry, Me., on May 12. The men were members of a driving crew employed by the Great Northern Paper Company.

The total assets of the International Paper Company, whose general offices are at 30 Broad Street, New York, as of January 31, 1914, amount to $73,010,714, in comparison with $72,821,571 in the year before. Real estate, woodlands and machinery are carried at $47,079,297; material, stock in process and merchandise at $8,122,923; and cash and debts receivable at $7,894,638, against $7,761,239 last year. Notes and accounts payable are $6,664,522; the funded debt is $15,417,000; and the profit and loss is reported as $11,079,692, comparing with $10,596,989 a year ago.

The mill of the Central Box Board Company at Sterling, Ill., was closed for a short time several weeks ago while undergoing needed repairs. Much of the machinery of the paper mill needed repairs, and the whole mill was gone over before operations resumed.

It now appears that the business is increasing under the new management of the Nashua River Paper mill at Pepperill, Mass., as another paper machine was placed in operation there last week.

Republican Carr, of Hopkinton, Mass., is proud of a letter he has just received from Charles S. Bird, which contradicts reports that in his paper mills in other states than Massachusetts, and also in Canada, he works his tour-workers more than eight hours a day. Mr. Bird says that those who respect the truth might easily have learned that all his tour-workers, wherever the mills are located, are on the eight-hour shift.

The work on the new building of the Dubuque Paper Company at Dubuque, Ia., has been at a standstill for nearly three months, owing to the strike of the brickmakers at Chicago, which has been in progress since March 1. This strike has caused considerable delay in building operations throughout the middle west, and although several attempts have been made by the employees to arbitrate the matter, no success has so far been noted. The building of the Dubuque Paper Company has been constructed as far as the sixth floor, but the laborers have been unable to go any further. The contractor will not make any forecast as to when the work will be resumed.

A compromise bill to regulate the water power diversion rights at Niagara Falls, N.Y., was agreed on at a conference on May 14 between Secretary of War Garrison and Representatives Harrison, Clive and Cooper, representing the Home Foreign Affairs Committee. The bill gives the Secretary of War the right to issue revocable permits for a daily diversion averaging 15,600 cubic feet per second on the American side and for importation of 250,000 horse-power from the Canadian side. The control over the rates, tolls and service would be left to the State of New York.

Listing liabilities at $22,248.33 and assets at $15,820.38, the Keyar Folding Box Company at Dayton, Ohio, has filed a voluntary petition in bankruptcy in the United States District Court at Cincinnati, Ohio. Of its liabilities, as listed in its schedules, $20,256.28 represents unsecured claims. Among the larger creditors are the Rayton Savings and Trust Company, loan, $4,200; the Third National Bank of Dayton, loan, $4,700; the Franklin Board and Paper Company, Franklin, Ohio, merchandise, $3,562.97; the C. L. LaBoiteaux Company, Cincinnati, merchandise, $1,512.69; the Richardson Paper Company, Lockland, Ohio, merchandise, $1,542.52; the Standard Paper Company, Kalamazoo, Mich., $1,025.63; the E. G. Stands Manufacturing Company, St. Paul, Minn., $700; the American Type Founders Company, Cincinnati, $650, and the M. D. Knowlton Company, Rochester, N.Y., $300.

The International Paper Company will shortly begin importing into the States of Maine, wood pulp from Nova Scotia and New Brunswick. The company has chartered the British steamer "Glencliff" and "Glenbridge" to land cargoes at Portland.

Foreclosure of a mortgage debt for $8,923.82 held by the Newington Paper Company against the plant of the Newington Board Company at Newington, Conn., has been granted by Judge Bennett in the Superior Court at Hartford, Conn. The mortgaged property will be sold to satisfy the judgment.

George Brigden of Brigden's, Limited, engravers and printers, has been elected chairman of the Toronto branch of the Canadian Manufacturers Association, succeeding R. D. Fairbair.

Ottawa Notes

Once more destructive bush fires have done great damage to timber in the Ottawa and Gatineau districts as has been the case generally in wooded parts of Ontario and Quebec, in fact. The past week has seen conflagrations raging ine the district around Ottawa which have destroyed over half a million dollar's worth of standing timber and pulpwood. The greater part of this loss has been to timber limits in the Gatineau district near Maniwaki, Que., while above Chelsea, near here, about four miles of timber have been destroyed. Nearly all the standing timber owned by the S tar Creek Lumber Company near North Low, in the Gatineau valley, was also burned down. The J. R. Booth limits on the Black River near Fort Coulonge were threatened, but a large force of men succeeded in beating back the flames until Friday's rains relieved them.

The lumber village of Portage du Fort, Que., was damaged to the extent of $150,000, the whole business section being wiped out last week.

Mr. Clyde Leavitt, chief fire inspector of the Railway Commission, stated in an interview that the railways were doing everything in their power to prevent bush fires near the railway tracks from spreading. "It seems to me," said Mr. Leavitt, "that there is too little attention paid to the fires in the cut over areas, and too much protection concentrated on the merchantable timber limits. If more effort were devoted to protecting the young timber it would give it a chance and prevent the fire from spreading to the limits where the trees are large enough for merchantable use."

The lowness of water in Ottawa district threatens to become a very serious problem both to lumbermen and paper mill owners. The water level at the foot of the locks at Ottawa in the Ottawa River is now about 14 feet, or 6 feet lower than the average for the time of year. There is so little water in the tributaries that thousands of logs are tied up in the creeks and lakes of the Ottawa and Gatineau chains. Along the River Desert conditions have been so bad that lumbermen have been unable to get their logs out at all. Last year saw low water conditions which according to the statement of an official of the J. R. Booth Company to your correspondent, made it necessary for that firm to purchase a large uantity of pulp from other sources. This year conditions will be very much worse. Not only will the low water tend toward a shortage of pulpwood—though this will be felt more next year than during the present season—but it will deprive the mills at the Chaudiere of part of their source of power and force them to run at half capacity.

Mr. J. R. Booth, Ottawa's veteran multi-millionaire lumberman and paper manufacturer, is so far recovered from the effects of the injury sustained some months ago at his plant that he is able to be at work again every day, as has been his wont during the greater part of his busy 87 years. Mr. Booth still requires the use of a cane, but this in nowise impedes the activity of his movements. He personally superintended from Ottawa the handling of the fire fighting force which guarded the Booth limits on the Black River during last week's bush fires. MAC.

A sale of 40 shares of Toronto Paper Mfg. Company last week at forty-one was a decided drop in quotations from the previous figure; sixty having been the prevailing price. This, however, is thought to be only an isolated case.

CREDITORS OF BATTLE ISLAND PAPER COMPANY ORGANIZE

(Special to Pulp and Paper Magazine)

New York, N. Y., May 25.

Bondholders of the Battle Island Paper Company of Fulton, N. Y. which has been in financial troubles for several months, have formed a bondholders Protective Committee for the purpose of betetr protecting their interest in the final settlement of the Corporation's affairs. The members of this committee are: S. Gay Daley, A. N. Ellis and Henry Lacy of this city and Giles S. Piper and A. W. Wiltsie of Fulton.

If the suggestions of the committee prevail, the bondholders will be permitted to withdraw their bonds from the Creditors Protective Committee, of which Paul Bayne of New York, is chairman, and which last summer assumed charge of the situation created by the financial embarrassment of the Hunters.

Under the creditors' agreement of July 19, 1913, four Syracuse banks, holding bonds as collateral for loans, transferred the bonds as well as the notes to Mr. Bayne's committee.

Now it is proposed that these collateral bonds shall be returned and reduced to ownership in order that the bondholders can act together in liquidation proceedings, under direction of the Supreme Court, which appointed the receiver. An agreement between the Creditors Committee and the bondholders for the purpose of carrying out the plan has been drawn, but not signed.

The significance of this step to reduce the collateral bonds to ownership, it was said yesterday, is the belief that as matters now stand there is no equity in the properties of the company covered by the mortgage which secures the bonds. The total bond issue is $500,000, and a considerable portion of it has been used as collateral.

A new phase of the situation developed last week when attorney W. P. Gannon filed a petition at Norwich, asking the appointment of receivers for the company. The application was made on the ground that the company had committed an act of bankruptcy in filing a petition in March 7 and having F. B. Shephard appointed receiver at that time. The new petition was signed by the Hood Coal Company, of Seneca Falls; the Morse Chain Company, of Ithaca; and the Hunter Fan and Motor Company of Fulton. It was stated that the company's affairs were dominated by the creditors' committee and that the affairs of the company were in such condition that the appointment of receivers was advisable.

Judge Ray appointed Charles N. Bulger, of Oswego, and David S. Costello, of Syracuse, receivers and fixed their bond at $100,000. F. B. Dilts, of this city, and Harold Stone and F. B. Scott, of Syracuse, were appointed appraisers the same as for the arms company.

Included in the assets are: Cash on hand, about $250,000; accounts receivable, $500,000; supplies and raw material, $20,000; buildings, land, machinery, etc., $250,000; timber lands in Canada over $500,000; and claim against the State on account of the appropriation of the company's power house, electric machinery and water power on the Oswego River, $1,850,000.

The order of Judge Ray gives to the receivers possession of all property and assets of the company and directs the company and Mr. Shephard, who was receiver under the dissolution proceedings, to deliver to the receivers all property, assets and effects under their control. The order also restrains all offices and directors of the company from prosecuting proceedings in the State Court for dissolution. It also restrains all from transferring, moving, or selling any of the property and also restrains from beginning any action against the bankrupt.

RECEIVER AND ADJUSTER APPOINTED FOR REMINGTON-MARTIN GROUP.

(Special to Pulp and Paper Magazine)

Watertown, N. Y., May 25.

The failure of the Remington-Martin group of paper mills in this section several weeks ago has caused considerable uneasiness on the stockholders as well as the bondholders and others interested in the welfare of the concerns. The crash was not altogether unexpected as the companies have been endeavoring to reorganize for two or three months. At one time Arthur C. Hastings, president of the American Paper and Pulp Association was slated to head the group and put them on their feet. The deal however fell through and Mr. Hastings was made president of the American Writing Paper Company.

Frank L. Moore, president of the Newton Falls Paper Company who is closely identified with other paper companies in this district was also invited to head the Remington-Martin concerns, and at one time it was thought that he would accept the proposition. For some reason or other he did not consider it and on May 8 a creditors' petition against the Company was filed in the United States Court of Utica, N. Y., and an adjuster and receiver was appointed. The liabilities of the companies was placed at $2,250,000.

The group consists of the Remington-Martin Paper Company, Norfolk, N. Y., the Raymondale Paper Company, Raymondale, N. Y., and the Norwood Paper Company Norwood, N. Y.

The receiver and adjuster appointed was Mark S. Wilder, president of the Diana Paper Company of this city. He furnished a $125,000 bond, and will continue the business for the time being.

The bondholders have appointed the following committee for their protection pending the reorganization of the companies: Geo. W. Hannohs, cashier of the Farmers' National Bank, of Adams; Dr. D. C. Rodenhurst, vice-president of the Bank of Philadelphia, N. Y. and E. M. West, vice-president of the Glens Falls Fire Insurance Company.

This committe has appointed former Judge P. C. Williams and Attorney N. D. Yost as counsel. The action of the bondholders in appointing a committee and procuring council is to get them to unite for their own protection in case there should be any necessity for them to take legel steps to protect themselves. It was said today that the action was in no way antagonistic to any one. There are bonds of the three companies amounting to $1,074,000, and while the bulk of them are held in this city, and this immediate section, there are many of them scattered all over owing to the fact that they are of small denomination. It is claimed that one or two holders of a small amount of bonds would have little weight if it became necessary to enter a legal fight of any kind, while if all the holders were united they would have a better chance of securing the necessary protection of their property. It is believed that there would be no necessity for taking action but that it is good policy to be prepared for an emergency.

The petition was filed by Crocker and McLoughlin of New York, representing a committee of creditors of the three concerns. Insolvency was declared at a meeting of directors of the concerns on May 5th. It is announced that reorganization is pending and will be brought about within sixty days by the creditors' committee.

The stock of the three concerns is held by the C. H. and C. R. Remington estates. Former Mayor F. M. Hugo of Watertown has been acting as manager and treasurer.

Of the indebtedness $1,000,000 is in bonds, and the remainder is due to merchandise creditors and on indorsed notes to banks.

The concerns employ 1,200 persons. The joint payroll is about $9,000 a week.

It was stated by one of the attorneys of the creditors' committee to-day that the financial troubles of the company were due to the removal of tariffs on print paper.

The appointment of a receiver was due to the prosecution of a number of suits in the State courts to recover about $40,000 due on merchandise and to individual noteholders.

The creditors who filed the petition were the Eastern Township Lumber Company, Ltd., of Canada, with total claims for $35,500; Peale, Peacock and Kerr of New York with claims for $38,000, and Moore and Munger of New York with claims for $1,500. They were represented by Attorneys Crocker and McLaughlin, who are also members of the reorganization committee.

Forest Products Exposition in Chicago and New York

On Saturday evening, May 9th, the first Forest Products Exposition held by the associated lumber dealers in the United States came to a close in the Coliseum at Chicago. The exhibit was a decided success in every way, 34,224 people attending. There were exhibits of every class of timber products manufactured in the United States, from Florida to Washington and from Texas to Maine. Novel exhibits in the way of structures which had been erected many years ago were shown as indicative of the powers of wood to withstand the ravages of time. At the close of the exhibit, a force of 300 workmen were put at work and the whole set of exhibits dismantled, packed and placed on a special train which left immediately for New York. In that city the exposition is being repeated in the Grand Central Palace, and it is expected that the attendance will quite equal that at Chicago. The exposition will close on May 30th.

The lumbermen of the United States think that the exposition was a long step toward placing the lumber business in a favorable light before the people and bringing the general public into a friendly attitude toward one of the Nation's great industries. Says the "American Lumberman": "Never before has the general public had an opportunity to secure such a wide knowledge of the lumber industry or to have visually demonstrated the beauty and utility of the products of American forests. The attendance increased in number from the beginning to the end and it was largely an accumulative attendance; that is to say, it was not brought about so much by advertising as it was by spreading the news from individual to individual that the Forest Products Exposition advertised at the Coliseum was really worth seeing and worth paying the price to see.

So successful in its attractive beauty and in the interest aroused was the exposition that it is taken for granted that it will be but the beginning of a series of expositions having for their purpose the educating of the people in regard to the forest industries and, consequently, counteracting the prejudice against wood that has been so insiduously cultivated. This season there will be only one more show and that held in New York, but other cities and lumber centres will wish the benefit of a similar enterprise. Before the close of the Chicago exposition delegates from Detroit and Cleveland were asking if the show could not be moved in its entirety to those cities.

Without exception the exhibitors were pleased with the attendance, especially with its quality, and were satisfied as far as it is in human nature to be satisfied with the results obtained. Yet the results are not all in and will not be until several years have passed.

One result of the exposition that would not be noticed by the outsider, but which was manifest to those in regular attendance, is worthy of special mention. It is that representatives of competitive woods were associated for ten days in an enterprise that was a combination of co-operation and competition and yet no ill feeling or friction was engendered; but on the contrary all worked together to make the show as a whole the success it was and to promote primarily the use of wood, as against its substitutes, and only incidentally to promote the particular woods displayed. There were no sneers of one wood against another, no conflict of statements, but a thoroughgoing spirit of mutual help. Those who have doubted it was possible for the different sections of the country and the different woods to get together in the promotion of their common interests have had their doubts answered. The industry is earnestly and sincerely united in an effort to enlighten the public in a way that will be helpful to all."

Many Canadians who were present at the show gave expression to the hope that in the near future such an exhibit may be featured in Canada, mainly for the purpose of indicating to the Canadian public the very great necessity of acting upon the suggestions which have been so often made from many sources that the timber trades of Canada should receive greater protection from the constant danger to which the forest resource is subject.

CRANE CONTRACT.

An order has just been received by the Herbert Morris Crane & Hoist Company, Limited, through their agents in Vancouver, Messrs. Waddy & Young for a 10-ton Hand Operated Overhead Crane fitted with Morris Roller Bearings to the main travelling motion.

This order was placed by the City Engineer of Prince Rupert, after considering quotations from all the leading North American makers of Cranes.

The new Power House is well under way, and is expected to be in full operation before the Fall.

M. Gottesman and Son, manufacturers of kraft and sulphite pulps announce the removal of their offices from 154 Nassau St. to 18 East 41st New York City.

British Trade Notes

There was a decrease of £27,576 in the total imports of paper, etc., into the United Kingdom during April, the figures, together with those for the corresponding year, being as under:—

	April. 1913.	April. 1914.
Printing or writings on reels	£ 90,455	£ 77,869
Printings or writings not on reels..	71,316	69,423
Hangings..	12,855	12,813
Other printed or coated papers ..	24,030	20,020
Packings and Wrappings	241,066	253,491
Strawboards	101,687	83,363
Mill and wood pulp boards	34,502	36,097
Total value	£634,568	£606,992
Total quantity (cwts.)	1,087,235	1,014,894

The imports of straw, mill and wood pulp boards show a heavy shrinkage last month, the decline in value amounting to £23,065. The receipts of printings or writings mark a decrease of £14,470, and a falling off of £4052 is registered in respect to hangings and other printed or coated papers. Packings and wrappings show an increase of £12,425, and unenumerated and articles of paper were in improved demand to the amount of £1,595.

The following imports from the United States are recorded for the month of April of this and the preceding year:

	Cwts.	Value.
Printings or Writings on Reels—		
1914	4,987	£2,897
1913	1,531	824
Printings or Writings not on Reels—		
1914	3,198	5,388
1913	2,311	4,084
Printed or Coated Papers—		
1914	337	2,011
1913	717	2,642

There were no imports of reel paper into the United Kingdom from Newfoundland during April last, neither for the corresponding month of last year.

For the four months ended April last, the total imports of paper, etc., into the United Kingdom show a small increase of £10,658 compared with the corresponding period of last year. The comparative values are as under:

	January-April. 1913.	January-April. 1914.
Printings or writings on reels	£375,093	£364,652
Printings or writings not on reels	296,269	279,161
Hangings	58,779	60,680
Other printed or coated papers	87,229	83,272
Packings and wrappings ..	933,431	994,090
Strawboards	341,972	303,580
Mill and wood pulp boards ..	216,183	218,360
Unenumerated, etc.	132,495	148,314
Total value	£2,441,451	£2,452,109
Total quantity, cwts.	4,117,456	4,005,642

Foreign competition, apparently, is very successful in the United Kingdom in respect to the supply of packings and wrappings, the value during the present year showing an increase of £60,659. The imports of printings or writings are not on so large a scale as for the corresponding four months of last year, there being a reduction of £17,108 under the heading of "not on reels" and a drop of £10,441 in regard to the arrivals of "reel paper." Hangings show an improved demand to the extent of £1,901, but other printed or coated papers were in less request to the amount of £3,957. The strawboard market has been somewhat disturbed of late, and British imports so far this year show a shrinkage in value of £38,392. Mill and wood pulp boards, on the other hand, were in better demand to the amount of £2,177. An increase is shown in the arrivals classified as unenumerated and articles of paper of £15,819.

The countries supplying the British market with printings or writings, the comparative values being given for the first four months of this and the preceding year, as follows:

	January-April. 1913.	January-April. 1914.
On Reels—		
Norway..	£157,381	£167,310
Sweden	80,016	57,650
Newfoundland	36,850	52,271
Germany	42,225	43,048
United States	2,732	9,567
Other countries	52,889	34,806
Not on Reels—		
Germany	97,631	92,963
Norway	69,315	77,205
Belgium	28,546	33,654
United States	22,750	23,680
Sweden	38,603	22,024
Other countries	39,424	29,635

Hangings and other printed or coated papers were received as under from the countries mentioned:

	January-April. 1913.	January-April. 1914.
Hangings—		
Germany	£35,191	£35,120
Belgium..	15,681	18,620
Other Countries	7,907	6,940
Other Printed or Coated Papers—		
Germany	43,568	44,889
Belgium	22,724	20,511
United States	10,442	7,595
France	7,286	6,063
Other countries	3,209	4,214

Packings and wrappings of the values stated were received from the following countries:

	January-April. 1913.	January-April. 1914.
Sweden	£289,243	£295,576
Germany	233,668	275,696
Norway	212,165	217,419
Belgium	78,969	95,096
Russia	49,488	37,257
Other countries	69,898	73,046

The countries of supply are not given in regard to the other items specified in the import list.

Oppose Government Paper Mill

The establishment of a Government paper mill was suggested in the House of Commons the other day during a debate on the Stationery Vote, but the chairman of the Stationery Committee replied that it would not be an economical procedure. While the Stationery Office buys nearly £500,000 of paper in a year, mostly for use in London, so many varieties of paper of so many different qualities and quantities at different times are needed that a paper mill would be a doubtful experiment. At present paper mills tender for the supply of paper to the Government, although there seems to be considerable room for improvement in this respect, for of 203 mills (out of a total of 245 mills in the country) which are on the Stationery Office list, few tender. Apropos of House of Commons and paper, the class of notepaper used by members of Parliament has been again the subject of criticism, and it has been suggested that if the Government made a standard quality applicable to each House instead of there being various kinds of paper to suit various tastes, a saving of over £1,200 a year would be effected. It is reported by the Treasury that the existing stock of Parliamentary notepaper is coming to an end and it is proposed to substitute a cheaper kind of notepaper.

Printing Paper in Demand.

Figures published recently show that the circulation of the Times has jumped from 53,000 per day to over 170,000 daily, as a result of the reduction of the price from 2d. to 1d. per copy. This increased demand, it is stated by the Times, has caused a paper famine in a small way. Since the middle of March the publishers at Printinghouse Square have been engaged in a desperate struggle to obtain sufficient paper of the famous hard white quality associated with the Times, and an unusually large supply of paper has been manufactured with that object in view by Messrs. W. V. Bowater & Sons, Ltd.; The London Paper Mills Company, Ltd.; Northfleet Paper Mills, Ltd.; Albert E. Reed & Company, Ltd.; James Spicer & Son, Ltd.;Townsend, Hook & Company, Ltd.; and James Wrigley & Son, Ltd. Even now, however, the paper states sufficient raw material for the Times is not available.

—Paper Trade Journal.

PAPER YARN WOVEN INTO CLOTH.

Paper yarn is now being spun and cloth woven from it at Dundee in Scotland, in a mill which has been specially fitted for the purpose, and the proprietors of the mill who have been putting forward great efforts in connection with the business for some time past, are meeting with considerable success in the venture. The firm in question is Ferguson & Co., of Bedville Works, Lochee Road, Dundee, Scotland.

MARCH IMPORTS INTO U.S.

(Special to Pulp & Paper Magazine.)

Washington, D.C., May 21, 1914.

Statistics issued by the Bureau of Foreign and Domestic Commerce shows importations during the month of March of 25,460,654 lbs. of mechanically ground wood pulp, valued at $18,556; 58,844,021 lbs. of chemical unbleached wood pulp, valued at $1,002,822; and 23,514,054 lbs. of chemical bleached wood pulp valued at $557,413—a total of 107,858,729 lbs., valued at $1,749,791. These importations all came in free under the new tariff act, and shows an increase if compared with importations of March, 1913, of 27,883,151 lbs. in tonnage and $481,224 in value.

Only two countries exported ground wood pulp into the United States in March, viz.: Germany, 22,500 lbs., valued at $168, and Canada 25,438,154 lbs., valued at $189,388. The country shipping the largest amount of chemical unbleached pulp in during this period was Sweden (20,431,278 lbs., valued at $337,632), Canada was the second heavy shipper with 15,978 lbs. valued at $287,782; Germany was third on the list with 11,259,588 lbs., valued at $178,925. The other countries shipping this grade in, according to tonnage, were: Norway, Austria-Hungary and Russia in Europe.

Five countries exported chemical bleached pulp into this country during March. The heaviest shipper was Norway (13,847,480 lbs., valued at $331,460). Germany was second with 5,352,739 lbs., valued at $125,755; Sweden, third, with 3,080,718 lbs., valued at $70,879; Canada fourth, with 1,065,884 lbs., valued at $26,449; and Austria-Hungary fifth, with 167,233 lbs., valued at $2,870.

The importations during March completed the nine months' records of the Department, and are compiled as follows with comparisons with the corresponding period of 1913:

	Nine Months Ending March.			
	—1913.—		—1914.—	
	Quantity.	Value.	Quantity.	Value.
Mechanically Ground, lbs. (Free)	271,442,182	$2,247,035	263,355,347	$2,043,429
Duty	31,065,318	248,876	17,254,157	135,316
Chemical Unbleached, lbs. (Free)	37,872,666	678,806	395,642,343	6,591,590
Duty	429,958,985	6,626,035	60,219,923	994,348
Chemical Bleached, lbs. (Free)	9,282,962	239,942	108,730,723	2,529,990
Duty	112,074,671	2,503,982	13,895,570	331,230
Total ....lbs.	891,696,784	$12,544,676	859,098,063	$12,625,903

Importations of paper and manufactures of paper during March amounted to $2,529,933 in value, as against $1,783,048 worth brought in during March, 1913. During the nine months' periods the importations amounted to $20,617,272 in 1914; $16,054,128 in 1913; and $13,172,159 in 1912. The increase of 1914 over 1913 was in all probability due to the lowering of the tariff on news print; and 1913 over 1912 to the Canadian Reciprocity Act.

As will be seen by the following table, Canada was the heaviest exporter of news print into this country in March, 1914:

Countries.	Pounds.	Dollars.
Belgium	149,247	5,700
France	4,325	293
Germany	223,024	6,938
Italy	9,248	1,344
Netherlands	234,174	10,591
Norway	662,271	13,972
Sweden	36,017	1,326
England	82,516	4,727
Scotland	43,696	2,100
Canada	52,475,307	1,012,293
Hongkong	800	53
Total	53,920,625	1,059,337

Opening of New Mills

Fort Frances, Ont., May 26th.—Victoria Day was a notable event in the history of Fort Frances, as on that day the Town Council, Board of Trade and Fort Frances Pulp and Paper Co. formally opened the new paper mill with a grand concert and ball in the evening.

The celebration was held in the finishing room of the new mill and no pains or expense was spared to make it a success. Music was supplied by an eight-piece stringed orchestra from Duluth and the floor, which is a splendid maple one, afforded ample room for 200 couple. Refreshments in abundance were served on the second floor, where the cloak rooms were situated. There was plenty to eat and drink, all of which was free. Nearly a thousand invitations were issued, including those to prominent people in Port Arthur, Fort William, Kenora, Winnipeg, Brandon, Regina, Saskatoon and Moose Jaw; also the Twin Cities and Duluth. The ball and supper rooms were a regular fairyland, resplendent with electric lights in Japanese lanterns and flags and bunting. Colored bands of paper, the product of the mill, were used with artistic effect. The tables were decorated and the luncheon, which was served at all hours during the evening, was one of the features of the occasion.

The committee was—

Fort Frances Pulp and Paper Co.—President E. W. Backus, Mr. R. J. Young, Mr. John J. Ross.

Fort Frances Town Council—Mayor L. Christie, Councillor J. J. Hahkirk, Councillor J. P. Wright.

Fort Frances District Board of Trade—President D. C. McKenzie, Mr. O. C. Damm, Mr. J. A. Osborne.

The mill, which is one of the most advanced and up-to-date on the continent, has a capacity of 120 tons per day. It has two 186 inch Fourdrinier machines, among the largest ever built. They have a speed of 700 feet a minute. About 400 men will be employed in the mill and camps, and the pay roll will be half a million dollars annually The power for the new plant as well as that for the paper mill, just across the Rainy River at International Falls, Minn., is obtained from Couchiching Falls, where an immense dam and power house have been constructed and 35,000 horse power of electrical energy is generated. It is expected that fifty thousand acres of spruce will be required to feed the new ground wood plant and news print mill. Fort Frances is a natural gateway for logs, and it is estimated that over two million feet of timber pass each year down the Rainy River into Rainy Lake, to Fort Frances, being sluiced through the logway specially built for that purpose.

It is expected that proposed new developments in the Ontario and Manitoba Power Company will be made known in a short time. The President, Mr. E. W. Backus, is known as one of the most progressive and enterprising of the leaders of the pulp industry.

Ontario and Minnesota Power Co. New Plant at International Falls.

PULP CONDITIONS IN EUROPE

(Special to Pulp and Paper Magazine)
New York, May 25, 1914.

There has been a good deal of variation in the reports made by importers regarding the condition of the foreign sulphite market. To get true data concerning the exact situation in Scandinavia has been a difficult task. The latest advices from Europe concerning the pulp situation shows that there is really plenty of sulphite on hand for offer both for this year and next. "Swedish papers," according to one importer, "have made much of the inquiries sent from this side of the Atlantic. There is no doubt, however, that mills have not made the best of any offers that have gone from America. The leading magazine of the Swedish pulp industry spoke truth when it reported that several sales of sulphite for prompt delivery had been made in the neighborhood of $36.45 to $37.55 a ton, f. o. b. export harbor for easy bleaching, including customary discounts and commissions."

Other figures were given for the various grades of sulphite which were for orders of the same character. There are a number of new sulphite mills being erected in Sweden and as a result, it is said, prices of sulphite have gone down considerably. "This reduction in price," adds the interviewed, "has brought about a number of good sales of this grade for future delivery. Foreign values have been for such orders about $29.50 to $30.50 f. o. b. for easy bleaching and $28.30 to $29.50 for strong sulphite.

According to the same reports on foreign conditions there has been a good deal of attention paid in Scandinavia to the views expressed in England that the present prices of paper in England will not permit paper makers to exceed 1.65c. to 1.75c., c.i.f. England. This, it is said, is absolutely the limit that English mills can pay. "Scandinavian mills, especially the larger ones," added the importer, "will not sell less than 1.75c. c.i.f. Great Britain at any time from this year on for several years to come. In fact, Swedish sulphite mills seem to be determined on boosting the price of sulphite to 1.95c. a pound, c.i.f. Of course, paper makers in England are unanimous in their view that this is positively an impossible price. This is probably due to the fact that, contrary to British paper makers' statements, the tendency in England today is a cheapening of paper prices. This may alter the attitude of the sulphite maker. Leading agents in England to-day are asking prices c.i.f. England about as follows:—

Bleached Sulphite	2.55c to 2.65c
Easy Bleaching Sulphite	1.87½c to 1.90c
Unbleached Soda	1.67½c to 1.80c
Strong Sulphite	1.62½c to 1.67½c
Unbleached Soda	1.57½c to 1.67½c
Kraft	1.50c to 1.57½c

How much business is done at these prices is difficult to say."

There is a prevailing impression abroad that American mills are inclined to hold off in making contracts, as they believe that foreign pulp can be bought in the future at a price that is lower than now quoted. The impression is that Americans believe prices will weaken, and that they will delay entering into contracts as long as the present prices are insisted upon by Swedish pulp producers.

"England is not unlike this in attitude and paper makers there are not inclined to buy unless compelled to do so. There is, it is said, plenty of sulphite unsold in Germany. The present price of Russian pulp wood has caused certain German pulp manufacturers no little difficulty. They find it necessary to look to other quarters for their timber and have made a rather impolitic move in trying to obtain supplies of wood from Sweden."

The situation abroad appears to be then that, although there are rather plentiful supplies of pulp on hand in manufacturing centres, the producers are not anxious to reduce the price in order to cut down any over production. The insistence of British paper manufacturers may tend to shade prices slightly, but pulp producers are making a decided effort to maintain 1.75c as a minimum, and in fact are strongly bent on pushing the price nearer 1.90c. Spot orders for prompt delivery are commanding fairly good prices, viz., 1.85c. to 1.87½c. for easy bleaching, and 1.62½c. to 1.67½c. for strong sulphite, at the mill. These are evidences of what may be the future value of pulp when paper makers come actively into the market.

MACHINE FOR CLEANING BLOCKS OF WOOD.

A machine for cleaning blocks of wood has been patented in Germany, which comprises a conveyor which conducts the blocks longitudinally through the machine, and a roller which is built up of small grinding discs in order to be able to grind the uneven parts of the wood. A second roller is provided with longitudinal grooves about 1.5 cms. apart. Both rollers rotate in the same direction. The grinding roller has a speed of 700 and the other 20 revs. per minute. An automatic feeder supplies the blocks into the machine and the conveyor guides the block through the machine. The speed of the wood when passing through the machine can be regulated according to the nature of the wood. Well seasoned timber can pass through the machine at a high velocity.

Spraying pipes constantly clean the wood and the grinding faces from bark and dirt whilst the machine is working. The loss of wood in the machine is 5 per cent less than that of other machines known heretofore.—Papier-Fabrikant.

CATALOGUES

Morris Travelling Trolleys

A copy of the newly issued bulletin B5 of the Herbert Morris Crane and Hoist Company, Ltd., is just to hand, describing the various types of traveling trolleys made by the company. These Morris trolleys are of many patterns, to run either on a flat-bar track or on the lower flange of an ordinary steel I beam. Some of them are prepared for short straight runways, while others, containing suitable swivels, are flexible in a horizontal direction, and thus permit of the use of curves or "bends" in the track. The bulletin contains a great deal of practical information of immediate interest to all users of this kind of equipment. The illustrations, diagrams and tables of dimensions and prices are arranged in a handy and useful form.

BACK NUMBERS OF THE PULP AND PAPER MAGAZINE WANTED

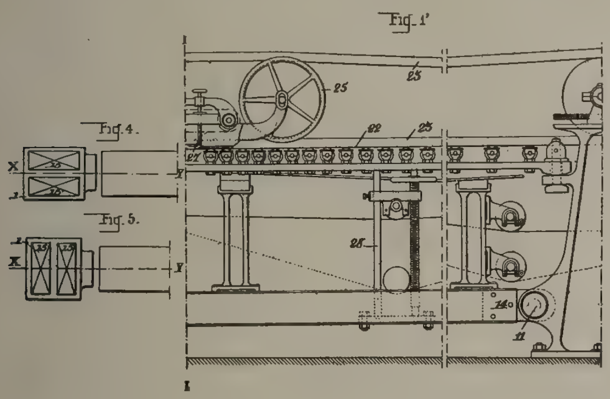
The publishers are anxious to secure copies of the July 1st and July 15th, 1913, issues of the Pulp and Paper Magazine.

NEW PATENTS

PAPER-MAKING MACHINE.

Marcel Lamort, of Vitry-le-Francois, France, Inventor.
U.S. PATENT No. 1,093,998.

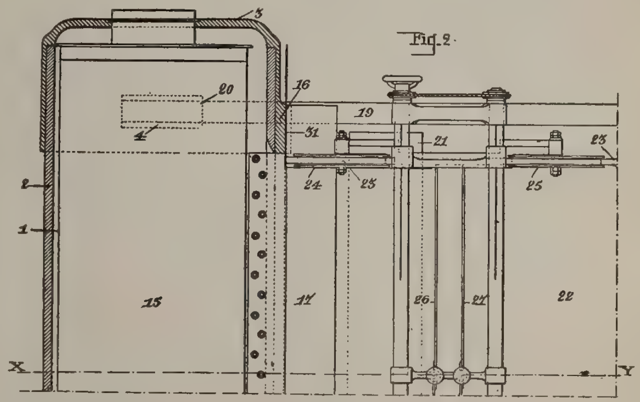
The present invention relates to a new arrangement of the working table or frame for paper making machines in which the strainer or strainers participate in the shake and in the vertical adjustment of the frame, the characteristic feature of the new arrangement being the combination in a single and uninterrupted structure of the strainer and the frame or working table of the paper making machine.



According to the present practice the strainers of the various types in use which are arranged at the wet end of the paper making machine are not rigidly connected with the frame proper over which the wire is moved. On the contrary the two named parts of the paper making machine are generally separated by passages and in all the known constructions the pulp passes from the strainer on to the wire through channels or chutes which are of a more or less complicated construction and frequently comprise small cascades. Moreover in the known constructions, the table or frame proper receives a shaking motion from side to side called "shake," whereas the strainers do not participate in the said movement. According to the present invention the said two parts of the paper making machine, namely the strainers and the frame proper are combined in a single and compact structure in such a manner that the straining apparatus forms an integral part of the frame proper and entirely participates in the shaking motion. This arrangement has very important advantages as regards the construction of the paper making machine and also as regards the manufacture of the paper or cardboard produced thereon.

As regards the construction of the paper making machine, the new arrangement forming the subject of the invention enables a considerable simplification to be realized as it permits various parts which were hitherto required between the strainers and the wet end of the machine, such as chutes, channels, aprons made of rubber and gates to be entirely dispensed with. The improved arrangement has moreover the following advantages: It enables the breast roll end of the frame to be adjusted to different elevations within very wide limits and without the use of any special devices. The vat of the strainer may be utilized as the main cross beam connecting the longitudinal beams of the frame proper. The space required for the installation of the straining apparatus is reduced to a minimum which results in a considerable saving.

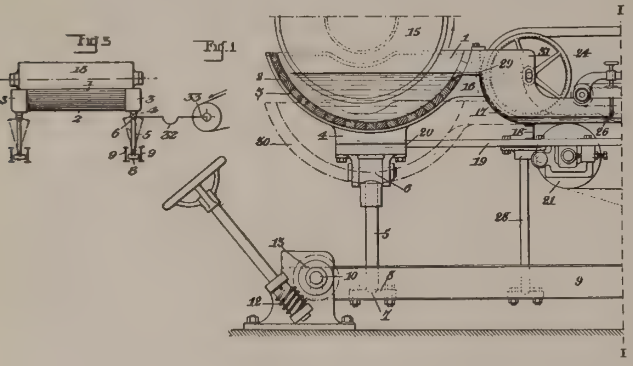
As regards the formation of the paper or cardboard sheet, the advantages of the improved arrangement forming the subject of the invention are the following: The length of travel of the pulp is reduced to a minimum. The loss of pulp due to the necessity of changing from time to time the grade of the stock and to stoppages is reduced to a minimum. Since the vat of the straining apparatus takes part in the shaking motion of the frame, the pulp contained in the vat is continuously shaken which has the result of avoiding the formation of deposits and of maintaining the pulp in a very homogeneous condition of density in all parts of the vat. If strainers of the revolving type are used the improved arrangement increases the output or efficiency of the strainers as owing to the vibratory motion of the vat or vats with regard to drum or drums, which latter remain stationary, a number of pulsations is produced between the pulp contained in the drums and that contained in the vats. These pulsations facilitate the passage of the pulp through the slots of the drum which may in the usual manner have a combined rotary movement and up and down vibration. Since the width of the pulp sheet which passes from the discharge end of the strainer is exactly equal to the width of the sheet produced upon the frame (both being regulated by the so-called deckle straps made of rubber) all causes leading to a disturbance of the flow of the pulp by an increase or a reduction of the sectional area of the passage of flow are eliminated. These advantages are of the greatest importance as regards the formation of the sheet, as waves or ripples in the sheet are entirely avoided owing to the fact that the fibers flow along absolutely rectilineal paths from the vat of the strainer down to the gates or slicers which serve for determining the height or thickness of the sheet. The height or thickness is therefore maintained absolutely equal along the whole width. The improved arrangement moreover avoids one of the main causes of the formation of so-called pointed sheets since the quantity of pulp which arrives at the gates or slicers is absolutely uniform along the whole operative width of the frame.



In order that the invention may be clearly understood, one construction of the parts necessary to carry out the invention is illustrated in the accompanying drawings, the strainer illustrated being of the revolving type, for instance, a strainer of the known construction "Lamort." It should be noted, however, that the invention is not in any way restricted to the use of any particular kind of strainer, since most of the known kinds of strainers, flat as well as revolving, may be used in connection with the present invention, in some cases suitable alteration of the vats being required for the purposes of the invention.

Figures 1 and 1' assembled along the line I—I represent in elevation the straining apparatus combined with the frame proper of the paper making machine. Fig. 2 is a plan of one-half of the parts arranged near the breast roll end of the machine, the other half not shown being symmetrical to the illustrated half. Fig. 3 is a diagrammatic view illustrating the mechanism for imparting a shaking motion or jog to the vat of the strainer. Figs. 4 and 5 are diagrammatic top views showing two manners of mounting two strainers in a common vat, in the case of large paper making machines.

Throughout the drawings the same reference numbers have been used for the same parts.



In the example shown in the drawings, 1 represents the vat of a strainer of the Lamort type, which may consist of a number of wooden boards 2, the ends of which may be fixed by bolts in two pieces or cheeks 3 made of cast iron. These end pieces serve as supports and are provided at their undersides with suitable projections 4 to which are hinged at 6 vertical rods 5 of the kind generally used for supporting the frame proper. The lower ends 7 of the rods are adapted to pivot about the bearing plates 8 carried by means 9 which rest at their ends 13 upon supports 10 and are adapted to turn at their other ends about pivots 11.

The longitudinal beams 9 may be raised or lowered in a well-known manner by means of a cam and a screw spindle 12, their ends 14 being as above mentioned pivotally supported at 11.

It will be seen that the vat 1 of the strainer participates in the vertical adjustment of the table, while the drum 15 of the strainer as well as the means for rotating and vibrating the drum in the vertical direction, which means are not shown in the drawing, remain unaffected by the adjustment of the frame. The drum and its driving means may for this purpose be mounted independently upon the main frame or directly upon the floor. The lateral cheeks of the vat are provided with extensions 16, to which is connected by bolts a curved copper sheet 17, which extends the whole width of the working frame. The sheet 17 is also mounted upon a cross member 18 and the whole combination of parts is mounted upon the longitudinal beams 19, which are usually called the main beams of the working frame. It should be noted that contrary to the constructions at present in use, the main beams 19 are continued in front of the frame and are fixed at 20 to the vat 1 of the strainer.

21 is the breast roll, wheras 22 designates the endless wire cloth of the machine.

23 are the rubber straps usually called deckle-straps, which serve for determining the width of the paper sheet to be produced upon the wire 22, the said straps being as usual supported by grooved pulleys 24 and 25.

26 and 27 are the usual cross gates or slicers which serve for determining the thickness or height of the sheet of pulp flowing upon the wire, 22 according to the nature of the paper to be produced. Other vertical rods supporting the main beams 19 are shown at 28.

It should be noted that most of the elements are shown diagrammatically only, as they are very well known parts of a paper making machine.

The pulp passes from the vat on to the wire 22 directly flowing along the sheet 17, as soon as the level of the pulp within the vat reaches the point 29. It may be pointed out that the vat 1 may be arranged at any desirable height with regard to the wire, for instance as shown by chain lines at 30 in Fig. 1. A tight joint between the discharge end of the vat and the deckle-straps 23 is insured by means of copper plates 31 adapted to slide across the discharge end of the vat and to be adjusted according to the width of the paper sheet to be produced.

Fig. 3 shows diagrammatically the known arrangement for imparting to the table the lateral shaking motion called jog, in which the vat 1 of the strainer participates according to the invention. In the example shown the shake is obtained by means of a connecting rod 32, which is hinged to the main beam 19 and is driven by the crank 33.

For machines dealing with a very large quantity of pulp, two or more drums such as 15, 15', may be arranged within a common vat. As shown in Fig. 4 the axis of the drums may be parallel to the axis X—Y of the frame, or as shown in Fig. 5, the drums may be arranged at right angles to the longitudinal axis of the frame. In both cases the straining mechanism is connected with the working frame in the manner above described.

EDWARD P. BUTTS, OF SPRINGFIELD, MASS., INVENTOR PROCESS FOR DRYING PAPER

U. S. Pat. No. 1,094,195.

This invention relates to improvements in processes for drying paper.

Broadly, the invention consists in modifying the condition of the atmospheric air so as to enable it to take up or absorb definite quantities of moisture. This feature is very desirable in the manufacture of paper, particularly in that part of the making which relates to the drying and lofting process.

It is a well known fact that the quantity of moisture contained in the atmosphere varies from day to day with relation to its saturation point. This variation of course materially affects the rate at which it will absorb any additional moisture. For this reason the rate of drying paper depends very materially upon the per cent. of moisture contained in the air of the drying room. Some days it is very dry, and others very much saturated. On the days that the air is very dry the output of the mill is greatly increased, while on the moist days the output is very much lessened. The output is therefore uneven both in quantity and quality, due to this lack of uniform conditions in the process.

A feature of the invention is that it makes possible the maintenance of a uniform condition readily changed and made suitable for any particular quality of product affording rapid drying or lofting for a paper requiring such treatment, or slower drying or lofting for a paper requiring such conditions.

Fig. 1.

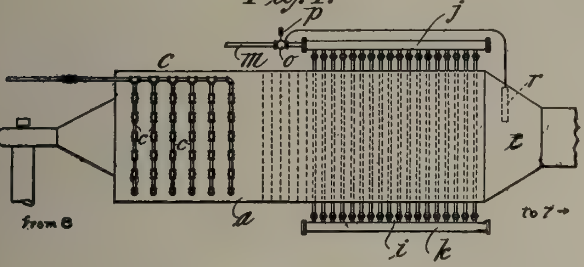


Fig. 2.

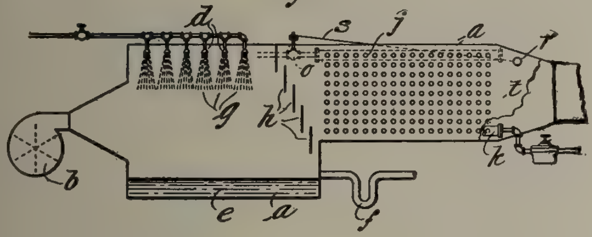
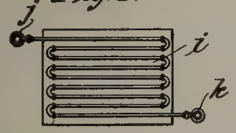


Fig. 3.



Another feature of my invention is that each quantity of paper is dried or lofted in the shortest possible time which develops the maximum product for these departments in any existing plant and requires a smaller outlay in the construction of the new plants.

In general, the invention consists in modifying the condition of the air that is sent to the drying or lofting rooms so that its capacity to absorb moisture is practically definite and uniform for any particular grade and weight of paper to be treated, whereby the output of dried paper is materially increased and the product rendered uniform from day to day.

In the drawings forming part of my application,—and which illustrate one form of apparatus in which my invention may be carried out,— Figure 1 is a plan view of the apparatus showing the heating coil, shower pipes, the thermostat, and the enclosed casting. Fig. 2 is a side view of the same illustrating the interior construction thereof. Fig. 3 is an edge view of one of the sections of the heating coils. Fig. 4 is a view in side elevation indicating paper suspended in lofting room in the usual manner and inlet and outlet pipes to permit the conditioned air to enter and escape therefrom. Fig. 5 is a view similar to Fig. 4 but showing the suspended paper in side elevation. Fig. 6 is a view similar to Fig. 4 but showing the conditioned air applied to the paper on a drying machine with the inlet and escape pipes for the air. Fig. 7 is a view of Fig. 5 in side elevation showing the position of the air inlet pipes.

Referring to the drawings in detail, a designates the casing member, one end of which is provided with a suction fan b. Located within the casing, adjacent the outlet of the suction fan, are a series of pipes c provided with nozzles d for producing a fine spray effect of the water, so that when the air leaves the fan and passes through the spray it will be thoroughly saturated when it leaves the spray. The water from the spray is caught in the lower part of the casing, as shown at e, where it escapes therefrom by means of the trap f. Placed beyond the spray g are a series of plates h against which the saturated air strikes so that the surplus or entrained water contained therein is separated therefrom when it strikes these plates. After the air leaves these plates it passes over a series of heating coils i, which have their ends connected to the upper and lower drums j and k, the upper drum being connected with a steam supply pipe m. Located within this pipe is a valve o.

p designates a steam guage to indicate the pressure within the supply m, and consequently that supplied to the coils i.

Connected to the valve o is a thermostat by means of a suitable connection s whereby the flow of steam to the coils i may be regulated to produce and maintain any desired temperature of the air as it leaves the coils and before it passes from the casing for use in the drying or lofting rooms. Therefore, the temperature of the saturated air is changed after it leaves the plates h and before it escapes from the casing a at

Fig. 4.

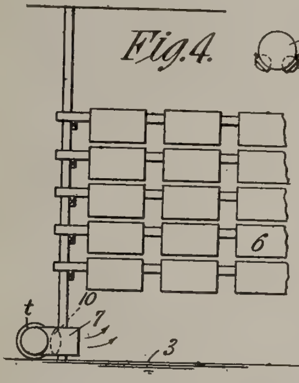


Fig. 5.

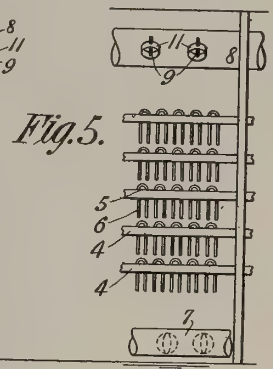


Fig. 6.

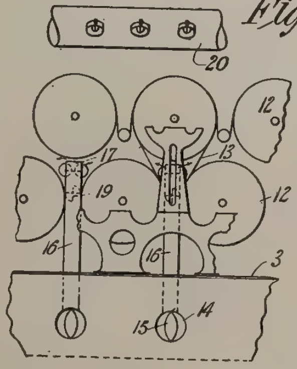
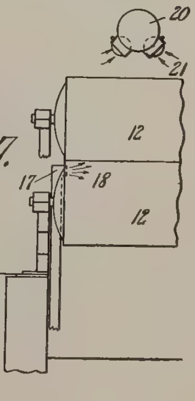


Fig. 7.



the point t, from which it passes on to the drying room. u designates a trap which is attached to the drum to carry away the water condensation.

From this apparatus it is clear that the temperature of the air, after it leaves the spray of water g, is the same as that of the water, say for example 65 deg. Fahrenheit, and that the air is of course in a saturated condition. It is also clear that if the temperature of this saturated air is raised, say to 80 deg. Fahrenheit, it will be in a condition to absorb or take up more moisture.

Referring now to the manner in which my improvement is applied to the drying of paper either while in the loft or passing through th drying machine, 3 designates the floor line of the drying room and 4 the beams for supporting the bars 5 on which the sheets of paper 6 are suspended. The conditioned air as it leaves the outlet shown at t in Figs. 1 and 2 enters the drying room or loft by means of pipe 7 and after passing upward through th drying room it escapes therefrom by means of the pipe shown at 8, entrance to this pipe being shown at 9. These two pipes are provided with suitable dampers or regulators indicated at 10 and 11 whereby the rapidity or rate of motion of the air through the drying loft is varied. After the air has taken up moisture in passing through the drying loft it is again drawn from the drying loft through the pipe 8 which leads back to the fan b, shown in Figs. 1 and 2, and is again passed through the spray of water shown at g, and its temperature again raised to the desired quantity, and a second time is drawn through the drying loft as described.

As showing the application of my invention to a paper drying machine reference is made to Figs. 6 and 7, i which the drying rolls are indicated at 12, over which the web of paper passes, shown at 13. The conditioned air from the outlet pipe t passes by means of the pipe 14 to the drying machine in which are placed dampers 15. The air from the pipe 14 passes upward through the pipe 16 and escapes at the outlet opening 17, as indicated by the arrows at 18, which causes the conditioned air to be blown parallel with the axis of the drying rolls and constantly into contact with the paper 13. The damper 19 is placed in the pipe 16 after the air has escaped from the pipe 16 and passed in contact with the web of paper and it is drawn through the pipe 20, which leads back to fan d. Suitable dampers or controlling devices are placed in the entrance or inlet openings 21, whereby the passage or rate of motion of the conditioned air through the drying machine is controlled.

By adjusting the temperature of the air as it leaves the casing a at the point t, it will be seen that this heated air, when it enters the drying room, is in condition to absorb a definite amount of moisture in drying or lofting the paper, which condition may be changed at will, regardless of the moisture condition of the outside atmospheric air, to a capacity for absorbing a greater or less amount, as required for the particular grade or weight of paper to be treated. This method of causing air of exactly the same capacity for absorbing moisture to enter the drying room, whereby a definite amount of moisture will be taken up by the heated air, is one that greatly increases the quantity of paper dried or lofted, and at the same time renders the same uniform in both quantity and in quality for each particular grade from day to day. The air, after it leaves the drying room, may, if desired, be carried or drawn back to the casing by means of the fan b and again sent to the drying room.

FREIGHT RATES ON NEWS PRINT

May 28, 1914

Washington: Carriers have been notified that rates on news print paper in carloads from Sault Ste. Marie, Ont., to points in Michigan, Ohio, Pennsylvania, and Indiana should be reduced on an average of 2 cents per 100 lbs. to conform to existing rates from Wisconsin mills. It is also held that rates to Illinois destinations and to St. Louis must not exceed by more than five cents the rates from Fox River group.

HOW MANY FEET IN A LOG?

At the recent Forest Producects Expositon in Chicago a novel contest was carried on by the "American Lumberman." The contents of a black walnut log which formed a corner pillar of the exhibit was to be estimated by visiting lumbermen. Out of 11,423 guesses seven estimated the actual contents, as was shown by the subsequent sawing of the log in a Chicago mill.

WORKING-UP WASTE PAPERS

The treatment of waste paper is different according to whether a mill works up regularly, or only now and then. In the latter case only the best sort of scraps is used. In the former case all sorts are worked up except the dearest.

Waste paper has become an important article of commerce, and there are special sorting establishments which will undertake to maintain a supply of any particular kind of scrap. As many as 40 different classes are made, and these are again sub-divided according to color.

The sorting and working up of the waste in small quantities for mixing in small proportions with whole stuff presents no difficulties, as no special machinery is wanted. The case is different when 10 tons or more of waste are used every year, and the sorting of such huge quantities cannot be economically done in a paper mill.

Large quantities mean large warehouse space, for the scraps must not be kept in the open air. A good airy shed is the best store-room, as it shelters the bales from wet while allowing free access of air. It should be as near the shop where the scraps are treated as convenient.

The best boilers for waste paper scraps are the spherical form, and the sorting-room should be over the boiling-room. For sifting out dirt hand sieves can be used, or an endless travelling screen. The sorting must depend on circumstances. Thus in sorting scraps with a view to making coloured paper more attention must be paid to quality than to colour. The boiler should hold two tons of paper or more. It cannot well be too large. One ten feet in diameter is none too big.

It is economical to use an old boiler, as it is not used for heating, but simply to soak the scraps. If heat is employed, the size in the paper scraps will be removed entirely. Some is unavoidably lost, but whatever is left makes economy in the after-sizing of the new paper into the composition of which the scraps enter. The boiler can be filled loose with the waste paper, or it can be squeezed in if it is necessary to make the boiler take up a large quantity. It must, however, be remembered that wood papers swell, so that they, or scraps containing a large proportion of them, must not be packed to tight. It is essential that the rouser in the boiler should not be interfered with in its action. Three or four hours are required in the boiler, which is revolved about five times per minute. This treatment facilitates and shortens the subsequent pug-mill work materially, and as the largest spherical boiler takes up no more than five horse-power—much less than a pug-mill—the economy of the previous treatment is obvious. No good results can be expected if the soaking is omitted.

As a substitute for the pug-mill, the kneading machine is not to be recommended.

The hollander must not receive the stuff too thick from the pug-mill, or the pulp will get too greasy. This danger is particularly imminent with long hollander rolls of large diameter, which work very rapidly.

As regards the work on the wire, the whole stuff must be greasy to prevent the water from running off too freely. It is often a good plan to warm the pulp a little, especially in making thick papers. Four suction boxes are used, two with suction and two without.

The felt of the upper couch roll may be an English unwoven one, if the paper has been well sorted beforehand, so that there are no coarse impurities. There ought to be three wet presses, with felts not too close, but not loose enough to mark the web.

The dry end should be ample, as gradual drying is advantages. Papers to be satined on one side only should not come too wet to the drying cylinders, or the moisture will escape slowly, and unevenly, and creases will be produced. A long wire is almost invariably necessary, if the machine is to be run at any reasonable rate.

We may now allude to some of the later ideas, some patented and some not, which are connected with using waste paper over again. Most of the patented processes involve the use of reagents for removing printer's ink and bleaching. Hence they are too troublesome and expensive. It is far better—in fact, the only way—to sort the waste paper, and to use printed stuff only for making coarse coloured new papers.

In conclusion, it is to be remarked that super-calendering is advisable, when possible, for papers into the composition of which much old waste paper enters. The calendering conceals the look, indescribable in words, which such papers are too prone to manifest, and which the expert remarks immediately.

Under present-day conditions, it is practically impossible to make wall-paper, even its best kinds, without the use of old scraps. The case is different with wrappings. No strength is wanted in a wall-paper, but a packing paper does require a certain amount. Hence the use of old paper in its manufacture requires care, and respectable makers of wrappings, who are the majority of the trade, take care to use only the best unprinted white scraps, and them in not too large a quantity.—Papier Zeitung.

SUBSTITUTE FOR CASEIN.

The product of experimental work on a substitute for casein in manufacturing coated paper shows remarkable results. The substance has been named Vegesto, and the intention on the part of its promoters is to form a company to manufacture coated paper, using it as a binder for the coating in place of casein or glue. Its value consists in its cheapness of production as well as the reduced mechanical operations necessary to its application, together with the fact that it may be mixed and kept standing without danger of decay or acquiring a disagreeable odor.

Unlike the casein or glue preparations which are at present used in making coated paper, it requires no boiling or steam heating, but may be mixed with cold water and clay, blanc fix and satin white. It dries very quickly, thus reducing the space ordinarily required in drying coated paper which at present must be festooned for some 150 feet and dried in a room at a very high temperature.

These conditions of manufacture, saving as they do the waste and labor, necessarily reduce the costs of making. The paper made with it will not curl. It takes a gloss almost as high as a friction finish paper, and samples of machine finish book paper as light as 25x38-30-500 have been coated with satisfactory results. Box boards coated with it seem to have much better folding qualities—the coating does not seem to crack so readily. It is also claimed that it will save considerable over regular coated paper in printing ink.

Excellent printed samples in half tone and 4-color work are shown, and label printers who have used the paper say it will take varnish to perfection. Eight colors of printing have worked satisfactorily.

A stock company to exploit the new proposition is now in proces sof formation and samples of the finished printed paper may be seen at 5 Beekman Street, New York, room 324. It is intended to call the company the Vegesto Coated Paper Co.—United States Paper Maker.

TWO BAD FIRES.

The fire which broke out near Digby on the afternoon of the 25th inst. did more damage than it was originally supposed. The blaze started in the yard of the Old South Road mill and, driven by a strong east wind into the dry underbrush, spread over a district of ten square miles. The homestead of Stephen Marshall barely escaped, as did the old mill, but the timber limit belonging to H. P. Warne and Company was badly damaged, although their mill was saved.

Damage to the extent of $75,000 was caused on the night of the 25th inst. by a fire in the Royal City Shingle Mills, near Westminster. The premises were well ablaze when the fire department arrived and nothing could be done to prevent the spread of the flames. The building was completely gutted.

CONCESSION TO BEAVER BOARD CO.

The St. Catharines Board of Water Commissioners has given permission to the Beaver Board Company to waste part of the overflow water from the Beaverboard factory above Thorold, into the Beaverdams creek. It was pointed out that this water could in no way contaminate the city water supply; the provincial Board of Health had given its sanction to the proposition.

Superintendent Milne said there was no chance of this water getting into the city reservoirs.

The desired permission was given upon the understanding that an agreement is to be drawn up by the city solicitor between the commission and the company to the effect that if at any time the overflow water from the factory is shown to be injurious to the city system, it be at once cut off, and a daily penalty for non-compliance is to be inserted in the agreement.

PULP AND PAPER NEWS

Lt.-Col. A. G. Peuchen has retired from the Presidency of the Standard Chemical, Iron and Lumber Co., Toronto, and L. M. Wood, of J. and L. M. Wood, has been appointed his successor. The company manufacture various wood chemicals and have four factories in Ontario and two in Quebec, with refineries in the Dominion, England, Germany and France. The securities of the company are largely held in England.

W. J. Boyd and E. S. Davidson of Ottawa, who are graduates of the Toronto School of Forestry, recently left Prince Rupert, B.C., Big River, en route to the Yukon on an extensive timber cruising expedition in the interest of fire protection of the province.

James Murray, who was the first President of the Master Printers and Bookbinders Association in Toronto and for many years president of the Murray Printing Co., Toronto, passed away recently after a short illness. Pneumonia was the cause of death. He was born in Glasgow, Scotland, in 1844, and came to Canada in 1868.

Richard Brown, the veteran head of Brown Bros., wholesale stationers, Toronto, on May 13 celebrated his eightieth birthday. He is still active and hearty and comes down to business every day. The twenty wholesale stationers of Toronto took occasion to present him with an appreciative address on vellum accompanied by a bouquet of eighty American Beauty roses, one for each birthday. The address expressed the hope that Mr. Brown might enjoy many more years of peace and joy and referred in the highest terms to his integrity and splendid record as a business man and honorable competitor. He joined his brothers in the formation of the present firm in 1856.

The work of cleaning out and repairing the old Welland canal, from which many paper mills in St. Catharines, Merritton and Thorold, obtain power is progressing favorably, and in the meantime the plants are all receiving a thorough overhauling. It is expected that operations will be resumed about June 4th.

Many plants in Ontario are complaining of low water and the level of the St. Lawrence is several feet below normal. On some of the northern streams there is being experienced considerable difficulty in getting out lumber drives. November and January have been the only months that have come up to the average in precipitation and the outlook for high water is not inviting in view of the fact that the total rainfall of last year was 24.11 inches while in the year previous it was almost 40 inches. So far there have been only two rainfalls to amount to anything. They were on April 29 and on May 25. The latter extinguished the forest fires which were raging in many parts of northern Ontario and threatened to do great havoc.

J. L. Englehart, Chairman of the Timiskaming and Northern Ontario Railway, who has returned from an inspection of the government line, states that a great deal of damage was done to standing timber by the recent fires. Mr. Englehart added that the question of extending the railway from Elk Lake to Gowganda and on to Sudbury is in the hands of the Ontario Government. The Commission has found that a line can be constructed for half a million dollars less than any previous estimate and is ready to go ahead when word is given from the parliament buildings.

It is expected that the Ontario Government will shortly appoint the Commissioners to carry out the provisions of the Workman's Compensation Act which was passed at the last session of the Legislature.

Many friends in the trade will extend sympathy to Alex Buntin of the Buntin, Reid Co., Toronto, in the loss of his mother, who passed away on May 25 at the residence of her son, 93 St. George Street, Toronto. She was the widow of the Alex Buntin, one of the paper pioneers of Canada.

H. Biermans, President, and A. G. Campion, sales manager of the Belgo-Canadian Pulp and Paper Co., Shawinigan Falls, Que., were in Toronto last week on business. They expect the new machine of the plant will be in operation by January 1st next, which will increase the output of news print to 175 tons per day.

The Axe Lake mill of the Muskoka Wood Manufacturing Co., was totally destroyed by fire on May 19, and gangs of men had a hard fight to preserve the camps of the company from destruction.

J. L. McNicol, general manager of the New Brunswick Pulp and Paper Co., Millerton, N.B., who has been spending a few days in Toronto, and with his family, in Georgetown, returned to Millerton this week. Mr. McNicol expects that the plant will resume operations in the near future. There is a strong probability if certain negotiations now pending are completed and adjacent limits acquired, that the mill may be converted into a news print plant.

The assets of the Northern Islands Pulpwood Co., Limited, of Port Arthur, who made an assignment some months ago to G. T. Clarkson, of Toronto, have been sold to F. H. MacPherson, of Detroit, representing the Detroit Sulphite Co., who are one of the largest creditors, their claim amounting to about $150,000. It is understood that the creditors will receive thirty-one cents net on the dollar in payment of their claims.

It is expected by the directors that the new ground wood plant of the Abitibi Power and Paper Co. at Iroquois Falls, Ont., will be in operation by July 1st. Good progress is being made on the new paper mill, and recently the force of men was considerably added to in order to rush the construction to completion.

Joseph G. Mayo, formerly of the Spanish River Pulp and Paper Mills, Limited and William S. Hofstra of Price Brothers Company, Quebec, are among those interested in the development of the Southern Paper Company, Moss Point, Mississippi. The company has installed the sulphate system of the Joseph H. Wallace Company by which Southern Pine slabs and edgings are converted into an excellent quality of paper.

The Markets

The market conditions continue steady in the news print line and a better demand is reported in many centres. The recent stir over the trouble with Mexico had the effect of increased orders from across the border and some of the Canadian mills, who had surplus stocks, were successful in cleaning them out. Prices continue firm and the outlook is good. Canadian plants, it is estimated, are now supplying about one-fifth of the entire consumption of news print in the United States and by the end of another year it is expected that fully one-fifth of the demand will be catered to by the Dominion. The total Canadian output at present is 17,000 tons and by this time next year, it is predicted, that production will reach at least 2,200 tons, the biggest factor being the new plant of the Abitibi Power and Paper Co., which alone will yield 225 tons, while new machines and additions to other mills now underway will make up fully three hundred more tons. Book and writing mills are busier than they have been for some time with orders from catalogue houses. Still the general tone of business is quiet and orders are smaller and fewer than a year ago. The jobbing line is not brisk and, although the summer season business has resulted in an augmented demand for paper bags and light wrappings, the trade in other lines is quiet. On Kraft paper particularly the bottom has all fallen out of the market and price-cutting flourishes. In ground wood there are a number of inquiries and if water conditions get much worse across the line and in Quebec there may be a shortage in this line before many weeks. The chief anxiety now is in regard to power and already some mills are able to grind only part time. In relation to sulphite the state of things keeps up very well and stocks on hand are not very large. The demand is, however, patchy and very few big plants across the line have yet placed contracts for next year. There is a disposition in all branches of the pulp and paper trade to hold back. Prices for mechanical and sulphite pulp remain unchanged, and in the paper stock and rag market there are only a few lines moving. Notwithstanding the cry of depression, one of the leading book and writing paper manufacturers remarked this week that although their output had been increased by nearly twenty per cent. during the year, the falling off in business in the last eight months had been less than ten per cent.

The following prices prevail, f.o.b, Toronto:—

News (rolls), $1.90 to $2 at mill, in carload lots.
News (sheet), $2.05 to $2.20 at mill, in carload lots.
News (sheet), $2.25 to $2.50, depending on quantity.
Book papers (carload), No. 3, 3.75c. to 4.25c.
Book papers (ton lots), No. 3, 4c. to 5.50c.
Book papers (carload), No. 2, 4.25c.
Book papers (ton lots), No. 2, 4.50c. to 5.25c.
Book papers (carload), $4.75 to $5.25.
Book papers (ton lots), No. 1, 5.25c. to 6.00c.
Writings, 5c. to 7½c.
Sulphite bond, 6½c. to 7½c.
Grey Browns, $2.25 to $2.75.
Fibre, $3.00 to $3.75.
Manila, B., $2.50 to $3.00.
Manila, No. 2, $2.85 to $3.50.
Manila, No. 1, $3.25 to $4.00.
Unglazed Kraft, $3.75 to $4.50.
Glazed Kraft, $3.90 to $4.75.

Pulp.

Ground wood (at mill), $15 to $16.
Ground Wood, $21 to $23, delivered in United States.
Sulphite (unbleached), $41 to $43, delivered in Canada.
Sulphite (unbleached), $42 to $44, delivered in United States.
Sulphite (unbleached), $55 to $58, delivered in Canada.
Sulphite (bleached), $56 to $58, delivered in United States.

Paper Stock.

No. 1 hard shavings, $1.87½ to $1.90, f.o.b., Toronto.
No. 1 soft white shavings, $1.75.
No. 1 mixed shavings, 50c.
White blanks, 87½c to 90c.
Heavy ledger stock, $1.40 to $1.50.
Ordinary ledger stock, $1.15.
No. 2 book stock, 45c to 50c.
No. 1 book stock, 70c to 75c.
No. 1 Manilla envelope cuttings, $1.10 to $1.15.
No. 1 print Manillas, 60c.
Folded news, 45c.
Over issues, 50c.
No. 1 clean mixed paper, 25c to 27½c.
Old white cotton, $2.50 to $2.75.
Thirds and blues, $1.30 to $1.32½.
No. 1 white skirt cuttings,, $5.00.
Black overall cuttings, $1.75.
Black linings, $1.75.
New light flannelettes, $4.75.
Ordinary satinets, 75c to 80c.
Flock, 90c.
Tailor Rags, 70c. to 75c.

Quotations f.o.b. Montreal are:—

Book and News Paper.

Roll News, $40 to $43 per ton for large orders; $45 to $50 per ton for small orders.
Ream News, $45 to $47 per ton for large orders; $50 to $60 per ton for small orders.
No. 1 Book, 5¼c to 6c per lb.
No. 2 Book, S.C., $4.50 to $4.75 in large quantities; $4.75 to $5.50 in small quantities.
No. 3 Book, M.F., $4.00 to $4.25 in large quantities; $4.40 to $4.50 in small quantities.
Writings, 5c to 7½c.
Sulphite Bond, 6½c to 8½c.

Wrappings.

Grey Brown, per 100 lbs., car lots, $2.25 net; 5 tons $2.45; 2 tons, $2.55; 1 ton, $2.65; less, $2.75.
Red Brown, car lots, $2.85; 5 tons, $2.95; 2 tons, $3.05; 1 ton, 3.15; less, $3.25.
B. Manilla, car lots, $2.85; 5 tons, $2.95; 2 tons, $3.05; 1 ton, $3.15; less, $3.25.
No. 2 Manilla, car lots, 3.10; 5 tons, $3.20; 2 tons,

$3.30; 1 ton, $3.40; less, $3.50.
No. 1 Manilla, car lots, $3.25; 5 tons, $3.45; 2 tons, $3.55; 1 ton, $3.65; less $3.75.
Kraft, $3.75 to $5.00.
Fibre, car lots, $3.25; 5 tons, $3.45; 2 tons, $3.55; 1 ton $3.65; less $3.75.
Fibre, $2.75 to $3.50.
Manila, B., $2.50 to $3.25.

On large orders to the jobbing trade some manufacturers are quoting 10 to 25 per cent below the above prices on wrapping.

Pulp.

Sulphite easy bleaching, $43 to $45 per ton.
News quality, $41 to $42 per ton.
Bleached sulphite, $54 to $59 per ton.
Kraft pulp, $3.60 to $4.00.
Ground woods, No. 1, $15 to $16.
Ground wood, No. 2, $22 to $24, delivered United States.

NEW YORK MARKETS

(Special to Pulp & Paper Magazine).

New York, May 26, 1914.

Movement in the bleached and unbleached sulphite markets has been confined to normal shipments through contract channels to consuming centres. Prices of bleached fibre abroad are firm, while the feeling here is that unbleached values will go still lower. Sulphate and Kraft have been fairly active in spot lots at 1.80c. to 1.85c. Rags have been in better demand than for some time, with most activity in the lower grades. Old bagging reflects a very sluggish tone and prices of all grades are weak.

The market for old waste papers has been quiet in the interval, with some falling off in prices. The higher grades of hard shavings are in fair demand at 2.40 to 2.50 a hundred pounds and No. 1 soft white shavings are quoted at 2.10c to 2.20c. a hundred pounds. There has been some wide differences of opinion among certain old waste papers regarding values of some grades. Overissue news is handled more or less directly, but there is one dealer who handles large quantities and is selling them at 67¾c a hundred pounds. Strictly folded news has been quoted at 45c. to 50c. a hundred pounds for clean papers. Some dealers have complained about this value, as they say the best price they could get is 42½c. a hundred Investigations reveal that some of these papers were crumpled and were not worth more than 42½c. Some grades of clean mixed papers have sold in the local market as high as 75c. a hundred, and poor mixed papers have sold as low as 20c. A fair market price is corroborated by leading dealers in the city at 30c. to 35c. a hundred for this grade. Flat stock has been in fairly good demand and values are unchanged. Board chips have been sold by some dealers at 32½c. a hundred for car lots. This is an exceptionally low value and it is probable that no money was made on the transaction. Packers are asking in most cases as much as 32½c. for this grade of paper stock.

Pulp.

Ground Wood, No. 1, $20.50 to $24, delivered.
Ground Wood, No. 1, $20 to $24, delivered.
Ground Wood, No. 2, $15 to $17, delivered.
Unbleached sulphite, dom., 1.90c to 2.20c, delivered.
Unbleached sulphite, imptd., 1¾c. to 2c., ex. dock, New York.
Bleached sulphite, domestic, 2.80c. to 3c., delivered.
Bleached sulphite, imptd., 2.60c. to 2.90c. ex. dock, New York.
Easy Bleaching, imptd., 2c. to 2.20c., ex. dock, New York.
Unbleached sulphite, imptd., 1.75c. to 2.10c., ex dock, New York.
Bleached sulphite, imptd., 2.60c. to 2.80c., ex dock, New York.

Paper

Business in general in this section reflects a healthier tone and more activity than for some time. The securities market has been more active than for several months. Large investment transactions have been closed and stock quotations have advanced. There has been a continuous state of hand to mouth buying and no one has carried any advance stocks on hand from jobber to retailer. It is not unlikely that there will be a marked improvement in all lines of business in the near future. The condition of the paper business at present is something entirely new to manufacturers who have been in the industry for many years. Their opinion is that there will be a good demand for all grades of paper during the summer months when water supplies are likely to be low and there will be difficulty in making paper enough to meet the demand. Men who visited mills and the trade all over the country report that they found very low stocks on hand among jobbers. Jobbers admit that they have cut greatly into their reserve stocks in supplying the small orders that have come to them. Printers have laid up no stocks to speak of and all the way along the line of demand there is a request for prompt delivery on small orders. Printers wait until they have an order on hand and then come into the market for paper with the statement that they do not need any more than a small quantity. Consumption has gone along steadily and the summer must necessarily bring a good demand for all grades. This is a state that some report never to have occurred before. It will undoubtedly bring better prices for all grades, as there will be more expense curtailed in the production of paper. The trial of a notorious criminal case in the New York Courts caused the metropolitan dailies to print large editions and many tons of news were consumed in the interval. The prices of all grades of news reflect firmness with an upward tendency. As this month is one of the two quietest months in the year of the book paper manufacturing industry there has been a rather quiet movement of all grades of book papers. Coated papers are firm in price, but the demand is rather quiet. Wrapping papers have been moving in fairly good way in all grades from jobber to consumer. Business among manufacturers, however, has not been very active. Jobbers have been cutting down their reserve stocks to meet the demands in small lots made on them. Krafts are rather quiet and values low. The tissue market is quiet and very weak. The specialty lines have been in good demand all the year and most manufacturers have made good money in them. Paper bags are firm in price but the demand is poor. Toilet papers and paper towels have been in fair demand. Cigarette papers have been in active demand and values have been firm. Hangings have been in good inquiry and values fairly high. Roofing papers have been in good demand on account of spring building.

News, rolls, transient business, $1.95 to $2.05 f.o.b.

News, rolls, contract renewals, $1.95 to $2.00 f.o.b.

News, side runs, $2 to $2.10 f.o.b. mill.

News, sheet, $2.25 to $2.30 f.o.b. mill.

Book papers, car lots, M.F.S., $3.75 to $3.90 f.o.b.

Writing paper, superfine, 13½c. to 17c., del. east of Miss. River.

Writing paper, extra fine, 11c., del. east of the Miss. River.

Writing paper No. 1, fine, 9c., del, east of the Miss. River.

Writing paper, No. 2, fine, 8c., del. east of the Miss. River.

Writing paper, engine sized, 4½c. to 8c., del. east of the Miss. River.

Bond paper, 5c. to 24c., delivered east of Mississippi River.

Ledger paper, 8c. to 30c., delivered east of Mississippi

Linen paper, 7c. to 18c., delivered east of Mississippi River.

Manila jute, 4¾c. to 5½c., delivered.

Manila, wood, $2.40 to $3.00, delivered.

Kraft, No. 1, $3.50 to $3.75 f.o.b. mill.

Kraft, No. 2, $3.25 to $3.50, f.o.b. mill.

Boxboards, news, $30 to $33 per ton, delivered.

Boxboards, chip, $28 to $31 per ton, delivered.

Boxboards, straw, $28 to $31 per ton, delivered.

Wood pulp board, 42.50 to 45 per ton, delivered.

Tissue, white, cylinder, 40c. to 42½c., delivered.

Tissue, fourdrinrie, 47½c. to 50c., delivered.

Tissue, jute Manila, 40c. to 41½c., delivered.

SCANDINAVIAN WOOD PULP MARKET

The Swedish export paper, "Svensk Export," states in the April number:—

The wood pulp market has been quiet on account of the many holidays, but the tendency is firm. There is not much inquiry for mechanical, and cellulose is dull. That the paper makers under the present situation are careful in regard to their purchases of both mechanical and chemical pulp is only natural. The United States market ought to give a strong assistance to our producers, if only the sales could be arranged in a satisfactory manner for them.

As it now goes, the development of our export to America only shows a small progress in spite of the now ruling free import to the United States.

Latest Quotations.

In England—	£	s.	d.		£	s.	d.
Sulphite—pulp, bleached	11	15	0	to	12	5	0
" " easy bleaching	8	15	0		9	2	6
" " strong	8	0	0		8	2	6
Sulphate " easy bleaching 1me..	7	12	0		8	0	0
" " kraft	7	7	6		7	15	0
Mechanical pulp, moist	2	8	0		2	15	0
Mechanical pulp, dry	4	5	0		4	10	6

All per ton English c.f.i. the east coast of England.

In France—	Francs.		Francs.
Sulphite—pulp, easy bleaching 1me..	23.00	to	24.00
" " strong	20.00		21.00
" " bleached	31.75		34.00
Sulphate pulp	21.00		22.00
Mechanical pulp, moist	11.00		12.00
Mechanical pulp, dry	12.50		13.00

All per 220½ lbs. c.f.i. Rouen.

The Swedish quotations are per ton English net f.o.b.

Mechanical, moist, white pulp	$ 8.00	to	$ 8.80
Mechanical, dry, white pulp	19.76		20.80
Sulphite, 1st, easy bleaching	38.67		40.00
Sulphite, 1st, strong	34.67		36.00
Sulphate, easy bleaching, ordinary..	33.33		34.76
Sulphate, strong	32.67		33.87

FUTURE SALES IN SWEDEN.

It is said that a contract has been made for delivery during 1914 and 1915 of wet, white pulp at $9.04 net f.o.b. Baltic port including customary agent's commission. This is indeed a very good price if compared with what has recently been accepted from Norway. However, the tendency of this market is not stronger and the business passing is still very small.

As to unbleached sulphite the sales during the last weeks have only been for small, prompt parcels, which seems to indicate that stocks at the paper mills are very small and that deliveries are wanted, although the spring shipments from the Baltic have already been dispatched. Prices are unchanged, firm.

Prices for sulphate for delivery during the present year are firm and favorable for sellers, but for 1915 and the following years very low prices must be accepted on account of the large increase of the production which will then take place.

NORWEGIAN PROSPECTS.

The Norwegian trade paper "Farmand" writes in the April 8 number:—

The sales of mechanical wood pulp for prompt shipment, which have been made from Norway since the beginning of the current year, amount in the aggregate to a considerable quantity, and it would seem, that they have sufficed to clear the stocks, which have been accumulating at the mills as a consequence of the exceptionally plentiful water supply of this winter. This week it has been found difficult, not to say impossible, to fill an order for 3,000 tons, the 6,000 tons which we reported last week having exhausted the available stocks.

No business is reported in cellulose.

Under date, April 18, appeared the following:—

Stocks of mechanical wood pulp in Norway have been within a very small compass. As there are still inquiries from the continent prices have hardened a little, but without any quotable change.

Sales of 1,000 tons of sulphate and 2,000 tons of sulphite cellulose have been reported this week at current prices.

In the April 25th number, there appeared the following:—

Both Norwegian and Swedish mechanical wood pulp mills appear to be practically cleared out for prompt, and as there are inquiries for the continent it ought to be possible to obtain somewhat better prices, but under the wretched condition, which still rules in the paper trade, paper makers naturally try to buy their principal raw material, wood pulp, as cheaply as possible, and it is therefore difficult to arrange business.

Cellulose is inactive.

Wood Pulp Industry of Sweden

As direct inquiries from Canadian pulp mills are frequently received in regard to the situation of the pulp market in Sweden, the following translation is taken from the Norwegian official journal, "Meddelelser fra Norges Oplysningskontor for Naeringsveiene, for April 25, may be of interest:—

The Swedish pulp industry is making rapid progress and plays an ever larger role in the trade balance of the country. The export from Sweden during 1913 was, of mechanical moist, 580,300,000 lbs., as against 479,020,000 lbs. in 1912; of mechanical dry, 129,820,000 lbs. during 1913, against 126,390,000 in 1912; of chemical dry, 1,371,900,000 lbs. during 1913, against 1,360,150,000 in 1912; of chemical moist, 127,600,000 lbs. in 1913, against 114,400,000 in 1912. This indicates quite a rapid rise throughout the whole line.

The Pulp Market.

In regard to the different kinds of pulp, the market has shown a somewhat different situation for mechanical and chemical.

At the commencement of 1913, the situation for mechanical pulp was on the whole satisfactory. The price for moist pulp was $9.60 to $9.87 per ton English f.o.b the west coast, and $9.20 to $9.47 per ton f.o.b. Norrland coasts including 3 per cent. agent's commission. For the dry pulp, the price varied from $20.80 to $21.03 per ton f.o.b. the west coast, and $20 to $20.27 f.o.b. Norrland coast, including 3 per cent. agent's commission. Meanwhile the supply of water at the mills increased during the winter, so that they could work up to their capacity, which caused a rapid increase of the stocks. The prices, therefore, dropped during the spring and reached their lowest point in the summer, when moist was quoted at about $8.37 to $8.64 f.o.b. the west coast, and from $7.73 to $8 f.o.b. Norrland harbors, including commission.

In the late summer, drought prevailed, and the prices rose as a consequence to $9.20 to $9.47 f.o.b. the west coast and $8.67 to $8.94 f.o.b. Norrland ports during November. Prices remained at this point until the close of the year.

The progress of the mechanical pulp industry in Sweden is indicated in the following figures, which show the production both for export and for the home consumption:—

	Tons English Moist Weight.
1893	122,000
1898	258,000
1903	330,000
1908	428,000
1913 about	675,000

Of the production in 1914 at the close of the year 1913 about 75 per cent. was placed.

For cellulose, the market was at the commencement of the year 1913 unusually favorable, and the strong increase in the price from 1912 continued also during the first quarter of 1913. In the beginning of March the prices for easy bleaching sulphite were up to $42.67 to $44 clean net f.o.b. and for strong sulphite from $38.67 to $40 clean net f.o.b.

These high prices, however, later in the summer brought a collapse, as the paper industry proved itself unable to keep pace with these prices and to supply themselves at those rates. Otherwise the hausse had only a limited consequence, as the English paper mills during the low prices of 1910-11 had secured pulp for several years ahead. The increase in the price, therefore, resulted in business stagnating and the purchasers barely covered their immediate wants. The sales to the United States, which next to England, is the largest customer of Sweden in this line, also were partly stopped on account of the preparations for the revision of the United States customs tariff. The prices thus during the summer were ultimately depressed. At the close of the year 1913 some improvement was noticed, as the statistical information shows a decided increase of the stocks of the cellulose mills. Of the production for 1914 probably more than 80 per cent. was contracted for at firm prices.

Development of Cellulose Industry

The development of the cellulose industry of Sweden has been strong and rapid. Several new mills have been started during the later years and a number of the older ones have increased their production.

The total production in Sweden of cellulose has been:—

	Tons English Dry Weight.
1893 about	54,000
1898	133,000
1903	272,000
1908	537,000
1913	850,000

The export of cellulose from Sweden has risen in the same proportion:—

	Tons English Dry Weight.
1893	43,663
1898	81,568
1903	233,819
1908	381,344
1913	653,500

AUCTION SALE OF TIMBER LIMITS

Re:- H. M. PRICE & CO.

Lumber Merchants, Quebec, Insolvent.

PUBLIC NOTICE is hereby given that on WEDNESDAY, August 5th, 1914, at 10 o'clock A.M., the Timber Limits hereinafter mentioned will be offered for sale by Auction without reserve, at the office of Messrs. LaRue & Trudel, Accountants, Dominion Building, 126 St. Peter Street, Quebec:—

			Sq. Miles.
License	No.	181 River St. Jean Br. East No. 1	22
"	"	182 River St. Jean N.E. Branch No. 2	18
"	"	183 River St. Jean East Branch No. 3	20
"	"	184 River St. Jean, No. 7	12
"	"	185 River St. Jean, No. 8	12
"	"	186 River Saumon & Tribut River St. Jean	34
"	"	187 River Magpie, No. 3	32
"	"	188 River Magpie, No. 4	32
"	"	189 River Magpie, No. 5	32
"	"	190 River Magpie, No. 6	32
"	"	191 River Magpie, No. 7	32
"	"	192 River Magpie, No. 8	32
"	"	193 River St. Jean, No. 1	24
"	"	193 River St. Jean, No. 2	24
"	"	194 River St. Jean, No. 3	23
"	"	195 River St. Jean, No. 4	18
"	"	196 River St. Jean, No. 5	20
"	"	197 River St. Jean, No. 6	20
"	"	198 River Magpie, No. 1	32
"	"	199 River Chambers, No. 1.	56

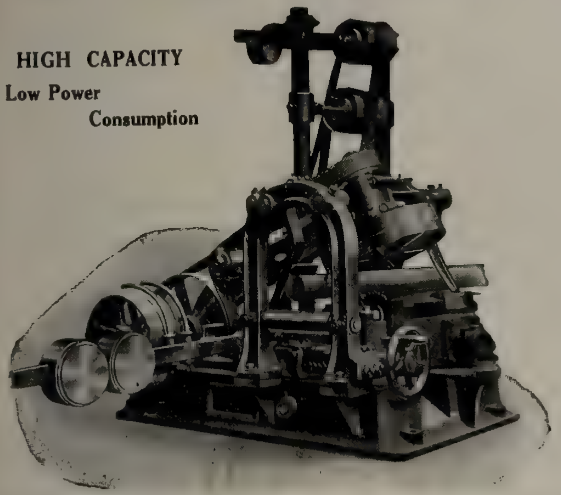
A total of 527 square miles more or less. Also a certain area of freehold land to be used as a mill site and fully described in deeds in the hands of the undersigned curators.

Conditions of Sale:—Ten per centum cash on adjudication, the balance payable upon transfer of the licenses, which transfers will have to be made at once, the transfer fee to be payable by the purchasers.

The purchaser will pay in addition to the purchase price, the auction duty of one per cent and will accept the licenses as they are without any responsibility on the part of the estate as to the condition, area or quality of the limits.

For inspection of the licenses and other particulars please apply to the undersigned:—

A. F. C. ROSS (Messrs. P. S. Ross & Sons),
142 Notre Dame St. West, Montreal.
EUGENE TRUDEL (Messrs. LaRue & Trudel),
Edifice Dominion, 126 St. Peter St., Quebec.



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TENDERS FOR WOOD LIMIT.

TENDERS will be received by the undersigned up to and including Monday the 8th day of June, 1914, for the right to cut wood of various descriptions on a certain area tributary to the Frederickhouse and Abitibi Rivers in the District of Temiskaming.

Tenderers shall state the amount they are prepared to pay as bonus in addition to the ordinary Crown dues, including 40c per cord for Spruce and 20c per cord for other pulpwoods, or such other rates as may from time to time be fixed by the Lieutenant-Governor in Council for the right to operate wood products mills on or near the area referred to.

Such tenderers shall be required to erect a mill or mills on or near the territory, and to manufacture the wood into products thereof in the Province of Ontario.

Parties making tender will be required to deposit with their tender a marked cheque payable to the Honourable the Treasurer of the Province of Ontario for ten per cent. of the amount of their tender, to be forfeited in the event of their not entering into an agreement to carry out the conditions, etc.

The highest or any tender not necessarily accepted.

For particulars as to description of territory, capital to be invested, etc., apply to the undersigned.

W. H. HEARST,
Minster of Lands, Forests and Mines.
Toronto, Ontario, 24th April, 1914.

TENDERS FOR ALLAN WATER RIVER WOOD LIMIT.

TENDERS will be received by the undersigned up to and including Wednesday, the 15th of July next for the right to cut ties from Spruce, Balsam, Banksian or Jack Pine, Poplar and Whitewood trees seven inches and upward in diameter two feet from the ground sufficient to supply a tie preserving plant for a period of twenty-one years from unoccupied, unsold and unlocated lands of the Crown tributary to what is known as the Allan Water River, tributary to the Grand Trunk Pacific Railway in the District of Thunder Bay.

Tenders shall state the amount they are prepared to pay as bonus in addition to the crown dues of $2 per thousand feet board measure for anything not manufactured into ties, and for ties at the rate of 5c each, or such other rates as may from time to time be fixed by the Lieutenant-Governor in Council.

Such tenderers shall be required to erect within the limits of the territory covered by the right to cut ties, or at some other place approved by the Lieutenant-Governor in Council a tie preserving plant.

Parties making tender will be required to deposit with their tender a marked cheque payable to the Honourable the Treasurer of the Province of Ontario for $25,000.00, to remain on deposit as security for the carrying out of the conditions of their tender.

The highest or any tender not necessarily accepted.

For particulars as to description of territory, capital to be invested, etc., apply to the undersigned.

W. H. HEARST,
Minister of Lands, Forests and Mines.
Toronto, Ontario, 27th April, 1914.

SALE OF PINE TIMBER ON METAGAMI INDIAN RESERVE.

TENDERS will be received by the undersigned up to and including the 6th July next for the right to cut the Red, White and Jackpine timber over eight inches in diameter on the Metagami Indian Reserve, situate on the Metagami River in the District of Sudbury.

For particulars, descriptions, conditions, etc., apply to the undersigned.

W. H. HEARST,
Minister of Lands, Forests and Mines.
Department of Lands, Forests and Mines,
Toronto, 2nd May, 1914.

No unauthorized publication of this notice will be paid for.

TIMBER SALE.

TENDERS will be received by the undersigned up to noon of the 15th day of July, 1914, for the right to cut the Red and White Pine timber on berths 1, 2 and 3, Township of Blyth, in the District of Nipissing.

For maps and conditions of sale apply to the undersigned, or the Crown Timber Agents at Sudbury and North Bay.

W. H. HEARST,
Minister of Lands, Forests and Mines.
Toronto, May 4th, 1914.

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DIEU ET MON DROIT

Timber Concessions in the Province of Quebec

Notice is given by the Government of the Province of Quebec, that, on the 11th of August, and on the 20th of October, 1914, permits to cut timber on over 8,000 square miles of Crown Lands will be offered at public auction.

The territory to be disposed of comprises some 1,200 square miles in the basins of rivers Ottawa, Harricana and Bell, in the Abbitibi region; 6,000 square miles in the Lake St. John northern region; 350 square miles in the Lake St. John East agency; 242 square miles in the Matapedia division.

On the first date above mentioned, permits will be offered at ordinary conditions on some 3,000 square miles.

The timber grants advertized for the 20th of October, comprising the basins of three large rivers in the Lake St. John region, with considerable water powers, will be subject to the obligation of manufacturing the wood into pulp or paper within the province of Quebec.

For particulars, please apply to the Department of Lands and Forests, Quebec, Canada.

ELZ. UIVILLE DECHENE,
Deputy-Minister of Lands & Forests.
Quebec, 11th April, 1914.

TIMBER SALE

TENDERS will be received by the undersigned up to noon of the 6th day of July, 1914, for the right to cut the Red and White Pine timber on Berths 1 B, 1 C, and 1 D, in the Mississaga Forest Reserve tributary to the north shore of Lake Huron, each Berth containing an area of 36 square miles, more or less.

For maps and conditions of sale apply to the undersigned or the Crown Timber Agents at Thessalon, Sault Ste. Marie, Webbwood and Sudbury.

W. H. HEARST,
Minister of Lands, Forests and Mines, Toronto, April 18th, 1914.

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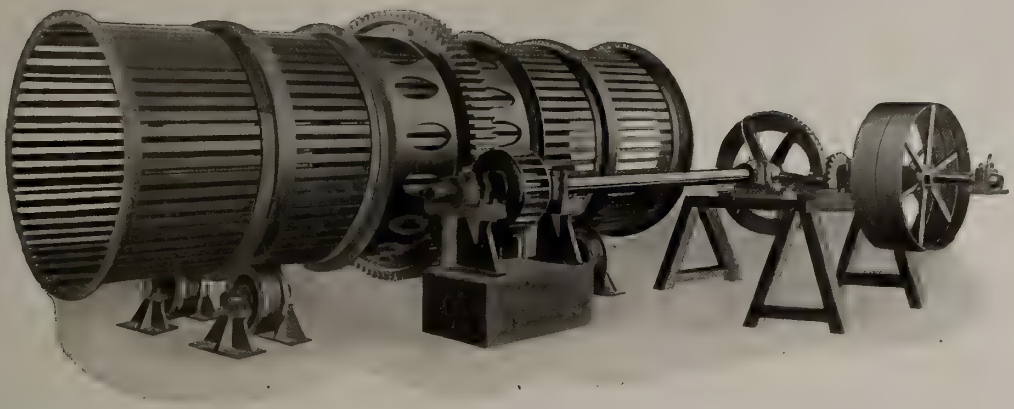

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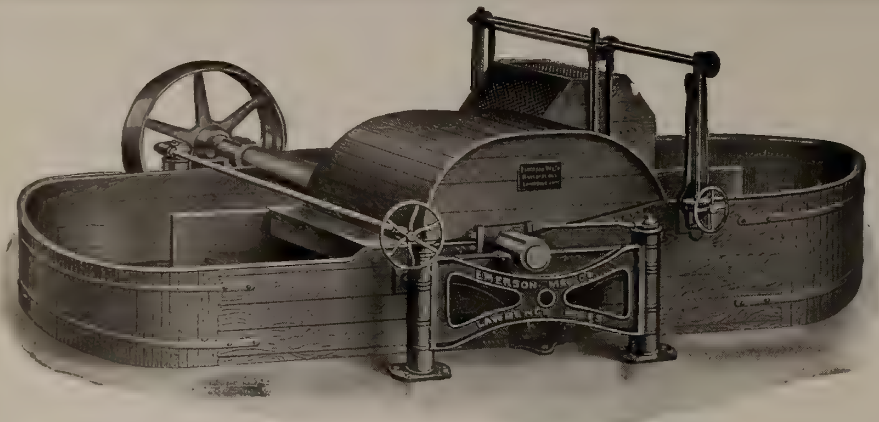

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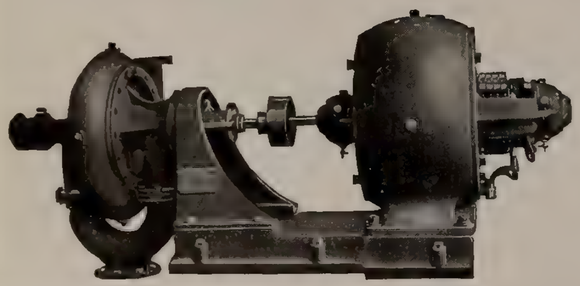

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INDEX TO MILL SUPPLIES

This Directory is published to facilitate the work of our readers, in the mills. If the information sought is not found, an invitation is extended to communicate with the editor, who will gladly be of all assistance possible.

- **Air Hoists**
  - Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- **Bags.**
  - Smart-Woods Ltd , Montreal, Que.
- **Barkers**
  - Boving & Co. of Canada, Limited.
  - Carthage Machine Co., Carthage, N.Y.
  - Canadian Barker Co., Ltd., Sault Ste. Marie, Can.
  - Green Bay Barker Co., Green Bay, Wis.
  - Hamilton, Wm., Co., Peterboro, Can.
  - Jenckes Machine Co., Sherbrooke, Que.
  - Waterous Engine Works Co. Ltd., Brantford, Can.
  - Valley Iron Works, Appleton, Wis.
  - Voith, J. M. Co., Inc., New York, N.Y.
- **Beaters**
  - Bertrams Ltd., Edinburgh, Scotland.
  - Boving & Co., of Canada, Limited, Toronto, Ont.
  - Chambers Ltd., 152 Bay Street, Toronto.
  - Dillon Mach. Co., Lawrence, Mass.
  - Emerson Mfg. Co., Lawrence, Mass.
  - Jones, E. D. & Sons Co., Pittsfield, Mass.
  - Marx & Co., J., London, England.
  - Process Engineers, Ltd., Montreal, Canada.
  - Voith, J. M. Co., Inc., New York, N.Y.
  - Waterous Engine Works Co. Ltd., Brantford, Can.
  - Tippet Arthur P. & Co., Montreal. Can.
- **Belting**
  - Can. Fairbanks-Morse Co., Ltd., Montreal, Canada
  - Capital Wire Cloth and Manufacturing Co. Ltd., Ottawa, Ont.
  - Dominion Belting Co., Hamilton, Can.
  - Federal Engineering Co., Ltd., Montreal, Que.
  - Federal Engineering Co., Toronto, Ont.
  - Manhattan Rubber Mfg. Co., Passaic, N.J.
  - Reddaway, F. & Co., Montreal, Can.
- **Bleaching Powders**
  - Brunner, Mond & Co., Montreal, Can.
  - Hooker Electrochemical Co., Wall St., New York, N.Y.
  - Klipstein, A. & Co., Ltd., Montreal, Can.
  - Winn & Holland, Montreal, Can.
- **Bleaching Machinery**
  - Boving & Co., of Canada, Limited, Toronto, Ont.
- **Blowers**
  - Sherbrooke Mach. Co., Sherbrooke, Que.
- **Boilers**
  - Canadian Allis-Chalmers, Ltd., Toronto
  - Jenckes Machine Co., Sherbrooke, Que.
  - MacDougall, J., Caledonian Iron Works, Montreal, Can.
  - Waterous Engine Works Co. Ltd., Brantford, Can
- **Brass Wire Cloth, Fourdrinier Wires**
  - Capital Wire Cloth and Mfg., Co., Ltd., Ottawa, Ont.
  - Christie, Geo., Ltd., Glasgow, Scotland.
  - Johnson, C. H. & Sons, St. Henry, Montreal, Can.
  - Taylor, James, St. Francois Xavier Street, Montreal, Can.
  - Tippet, A. P. & Co., Montreal, Can.
  - United Wire Works, Edinburgh, Scotland.
  - Westbye, P. P., Peterboro, Can.
- **Calender Rolls**
  - Bertrams Ltd., Edinburgh, Scotland.
  - Boving & Co., of Canada, Limited, Toronto, Ont.
  - Chambers Ltd., 152 Bay Street, Toronto.
  - Dillon Machine Co., Lawrence, Mass.
  - Farrell Foundry & Mach. Co., Ansonia, Conn.
- **Camel Hair Belting**
  - Reddaway, F. & Co., Montreal, Can.
- **Carriers**
  - Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- **Case Slings**
  - Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- **Causticising Systems**
  - Boving & Co., of Canada, Limited, Toronto, Ont.
- **Chemicals, Colors, Etc.**
  - Brunner, Mond & Co., Montreal, Can.
  - Gewerkschaft Sachtleben, Homberg, Niederrheim, Germany.
  - Klipstein, A. & Co., Montreal, Can.
  - Hooker Electrochemical Co., New York, N.Y.
  - Paper Makers' Chemical Co., Easton, Pa.
  - Tippet A. P. & Co., Montreal, Can. .
  - Wilson-Paterson Co., Board of Trade Bldg., Montreal, Can.
  - Winn & Holland, Montreal, Can.
- **Chain Crane**
  - Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- **Chain Blocks**
  - Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- **Chain Clutches**
  - Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- **Chain Slings**
  - Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- **hina Clay**
  - China Clay Co., Manchester, England
  - Klipstein, A. & Co., St. Peter Street, Montreal, Can.
  - Paper Makers' Chemical Co , Easton, Pa.
  - Wilson-Paterson Co., Board of Trade Bldg., Montreal, Can.
- **hippers**
  - Boving & Co., of Canada, Limited, Toronto. Ont.
  - Carthage Machine Co., Carthage, N.Y.
  - Valley Iron Works, Appleton, Wis.
- **hip Screens**
  - Boving & Co., of Canada, Limited, Toronto, Ont.
  - Carthage Machine Co., Carthage, N.Y.
- **ranes**
  - Boving & Co. of Canada, Limited, Toronto, Ont.
  - Hamilton, Wm. Co., Ltd., Peterboro, Can.
  - Northern Crane Works, Ltd., Walkerville, Ont.
  - Smart-Turner Mach. Co., Hamilton, Ont.
- **oal Handling Machinery**
  - Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- **ranes—Gantry**
  - Morris, Herbert, Crane & Hoist Co., Toronto. Ont.
- **Cranes—Hand Power**
  - Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- **Cranes—Overhead Travelling**
  - Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- **Cranes—Post Jil**
  - Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- **Cranes—Wall**
  - Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- **Conveying Machinery**
  - Caldwell, H. W. & Son Co., Chicago, Ill.
  - Jeffrey Mfg Co., Montreal, Can.
  - Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- **Couch Rolls**
  - Bertrams Ltd., Edinburgh, Scotland.
  - Chambers Ltd., 152 Bay Street, Toronto.
  - Process Engineers, Ltd., Montreal, Can.
  - Sherbrooke Mach Co Ltd., Sherbrooke, Q
- **Cylinders**
  - Bertrams Ltd., Edinburgh, Scotland.
  - Boving & Co. of Canada, Limited, Toronto, Ont
  - Chambers Ltd., 152 Bay Street, Toronto.
  - Sherbrooke Machinery Co., Sherbrooke, Que.
- **Cutters**
  - Bertrams Ltd., Edidburgh, Scotland.
  - Boving & Co., of Canada, Limited, Toronto, Ont.
  - Chambers Ltd., 152 Bay Street, Toronto.
  - Dillon Machine Co., Lawrence, Mass.
- **Cylinder Covers**
  - Boving & Co., of Canada, Limited, Toronto, Ont.
  - Johnson, C. H. & Sons, Ltd., St. Henry, Montreal, Que.
  - Kufferath, Andreas, Mariaweiler, Germany.
- **Cylinder Moulds**
  - Bertrams Ltd., Edinburgh, Scotland.
  - Chambers Ltd., 152, Bay Street, Toronto.
  - Sherbrooke Machinery Co., Sherbrooke, Que,
- **Cylinder Rolls**
  - Capital Wire Cloth and Manufacturing Co. Ltd., Ottawa, Ont.
- **Dandy Rolls**
  - Capital Wire Cloth and Manufacturing Co. Ltd., Ottawa, Ont
  - Chambers Ltd., 152 Bay Street, Toronto.
  - Johnson & Sons, C. H., St. Henry, Montreal, Can.
  - Marshall, T. J. & Co., Ltd., London, Eng.
- **Digester Lining**
  - Boving & Co., of Canada, Limited, Toronto, Ont.
  - Panzl Digester Lining Co., Muskegon, Mich.
  - Preston's Digester Lining Co., Radcliffe, Eng.
  - Process Engineers, Ltd., Montreal, Can.
  - Stebbins Eng. & Mfg. Co., Watertown, N.Y.
- **Digesters**
  - Boving & Co., of Canada, Limited, Toronto, Ont.
- **Digester Gauges**
  - Schaeffer & Budenberg, Brooklyn, N.Y.
- **Drainer Bottoms**
  - Snell, Samuel, Co., Holyoke, Mass.
- **Dryers**
  - Bertram Ltd., Edinburgh, Scotland.
  - Boving & Co., of Canada, Limited. Toronto, Ont.
  - Chambers Ltd., 152 Bay Street, Toronto.
- **Electric Cranes**
  - Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- **Elevating and Conveying Machinery**
  - Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- **Evaporators**
  - Boving & Co., of Canada, Limited, Toronto, Ont.
  - Process Engineers, Ltd., Montreal, Canada.
  - Scott, Ernest & Co., Fall River, Mass.
- **Exhausters**
  - The Sherbrooke Machinery Co., Sherbrooke, Que.
- **Experimental Machinery**
  - Chambers Ltd., 152 Bay Street, Toronto.
  - Marshall, T. J. & Co., Ltd., London, Eng.
  - Process Enginners Ltd., Montreal, Can.
- **Exporters**
  - Parsons Trading Co., New Tork, N.Y.
- **Felts**
  - Ayers, Ltd., Lachute Mills, Que.
  - Bates & Innes, Ltd., Carleton Place, Ont.
  - Bredt, F. & Co., New York, N.Y.
  - Chambers Ltd., 152 Bay Street, Toronto.
  - Dallyn, Jardine & Co., Toronto, Can.
  - Heimbach, Thos. Jos., Ltd., Duren, Germany.
  - Huyck, F. C., Albany, N.Y.
  - Johnson, C. H. & Sons, St. Henry, Montreal, Can.
  - Penmans, Ltd., St. Hyacinthe, Can.
  - Porritt, Joseph & Sons, -Manchester, Eng.
  - Spencer, J. H. & Sons, Bury, England. .
  - Tippett Arthur P. & Co., Montreal, Can.
- **Filters**
  - Boving & Co., of Canada, Limited, Toronto, Ont.
  - Chambers Ltd., 152 Bay Street, Toronto.
  - Norwood Engineering Co. of Canada, Ltd., Cowansville, P.Q
- **Fourdriniers Wires**
  - (See Brass Wire Cloth.)
- **Friction Hoists**
  - Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- **Gauges**
  - Schaeffer & Budenberg, Brooklyn, N.Y.
- **Generators and Transformers**
  - Chambers Ltd., 152 Bay Street, Toronto.
  - Siemens Co., of Canada, Ltd., Montreal, Can.
- **Gravity Lowering Blocks**
  - Morris, Herbert, Crane & Hoist Co., Toronto, Ont
- **Grinders**
  - Boving & Co., of Canada, Limited, Toronto, Ont.
  - Carthage Machine Co., Carthage, N.Y.
  - Glens Falls Mach. Works, Glens Falls, N.Y.
  - Hamilton, Wm., Co., Peterboro, Can.
  - Jenckes Machine Co., Sherbrooke, Que.
  - Voith, J. M. Co., Inc., New York, N.Y.
  - Voith, J. M., Wurtemberg, Germany.
  - Waterous Engine Works Co. Ltd., Brantford, Ont.

MILL SUPPLIES---Continued

Heating
- Sheldons, . .d., Galt, Ont.

Hand Hoists
- Morris, Herbert, Crane & Hois Co. nto, Ont.

Hoists.
- Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
- Northern Crane Works Limited, Walkerville, Ont

Hoists—Chain Electric and Pneumatic
- Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Jordan Engines
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Jones, E. D. & Co., Pittsfield, Mass.
- Process Engineers, Ltd., Montreal, Canada.

Knives
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Chambers Ltd., 152 Bay Street, Toronto.
- Crookes, Roberts & Co., Sheffield, Eng.
- Hay, Peter, Knife Co., Galt, Can.
- Tippet, A. P. & Co., Montreal, Can.

Kollergangs
- Bertrams Ltd., Edinburgh, Scotland.
- Boving & Co., of Canada, Limited, Toronto, Ont
- Chambers Ltd., 152 Bay Street, Toronto.

Laying Machines
- Chambers, Ltd., Toronto.
- Collis & Sons, J , London, Eng.

Motor
- Chambers Ltd., 152 Bay Street, Toronto.
- Siemens Co. of Canada, Ltd., Montreal, Can.

Presses
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Can. Boomer & Boschert Press Co., Montreal, Can.
- Chambers Ltd., 152 Bay Street, Toronto.

Paper Stock, Etc.
- Hough, R., London, England.
- Pullan, E., 490 Adelaide Street, W., Toronto, Can.
- Walker, J. R., & Co., 35 Common Street, Montreal, Can.

Paper and Pulp Machinery
- Beloit Iron Works, Beloit, Wis.
- Bentley & Jackson, Bury, England.
- Bertram, James & Son, Ltd., Edinburgh, Scotland.
- Bertram's, Ltd., Edinburgh, Scotland.
- Black-Clawson Co., Hamilton, Ohio.
- Canadian Boomer & Boschert Press Co., Ltd., Montreal.
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Carthage Machine Co., Carthage, N.Y.
- Chambers Ltd., 152 Bay Street, Toronto, Can.
- Dillon Machine Co., Lawrence, Mass.
- Emerson Mfg. Co., Lawrence, Mass.
- Farrell Foundry & Mach. Co., Ansonia, Conn.
- Fullner, H., Warmbrunn, Germany.
- Glens Falls Machine Works, Glens Falls, N.Y.
- Green Bay Barker Co., Green Bay, Wis.
- Hamilton, Wm., Co., Peterboro, Can.
- Harmon Machine Co., Watertown, N.Y.
- Jenckes Machine Co., Sherbrooke, Que.
- Jensen og Dahl, J. & A.
- Jones, E. D. & Sons Co., Pittsfield, Mass.
- Johnson, C. H. & Sons, Ltd., Montreal, Can.
- Marx, J. & Co. London, E.C., England.
- Moore & White Co., Philadelphia, Pa.
- Process Engineers, Ltd., Montreal, Canada.
- Pusey-Jones Co., Wilmington, Del.
- Rice, Barton & Fales Worcester, Mass.
- Sandy Hill Iron & Brass Works, Hudson Falls, N.Y
- Scott, Ernest & Co., Fall River, Mass.
- Sheldons, Ltd., Galt, Can.
- Sherbrooke Mach. Co., Ltd., Sherbrooke, Can.
- Smith, S. Morgan, Co., York, Pa.
- Stebbins Eng. & Mfg. Co., Watertown, N.Y.
- Ticonderoga Machine Works, Ticonderoga, N.Y.
- Valley Iron Works, Appleton, Wis.
- Voith, J. M., New York, N.Y.
- Voith, J. M., Wurtemberg, Germany.
- Walmsley, Chas. & Co., Bury, Eng.
- Waterous Engine Works Co., Ltd., Brantford, Can.
- Westbye, P. P., Peterboro, Can.

Paper Machine Tachomoters
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Schaeffer & Budenberg, Brooklyn, N.Y.

Paper Tester
- Chambers Ltd., 152 Bay Street, Toronto.
- Marshall. T. J. & Co., Stoke Newington, London. England.

Pneumatic Thickeners
- Sherbrooke Mach. Co., Ltd , Sherbrooke, Que.

Pneumatic Chain Blocks
- Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Press Rolls
- Bertrams Ltd., Edinburgh, Scotland.
- Chambers Ltd., 152 Bay Street, Toronto.
- Process Engineers Limited, Montreal, Can.
- Sherbroke Mach. Co Ltd., Sherbroke, Que.

Press Wire Cloth.
- Chambers Ltd., 152 Bay Street, Toronto.
- Kufferath, Andreas, Mariaweiler, Germany.

Pulp Stones
- Lombard & Co., Boston, Mass.
- Stancliffe Estates Co., Ltd., Darley Dale, England.

Pumps
- Bertrams Ltd., Edinburgh, Scotland.
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Canadian Allis-Chalmers, Ltd., Toronto, Ont.
- Carthage Machine Co., Carthage, N.Y.
- Chambers Ltd., 152 Bay Street, Toronto.
- Dillon Machine Co., Lawrence, Mass.
- Glen Falls Machine Works, Glens Falls, N.Y.
- Hamilton, Wm., Co., Peterboro, Can.
- Lawrence Machine Co., Lawrence, Mass.
- Lawrence Pump & Engine Co., Lawrence. Mass.
- Smart-Turner Machine Co., Hamilton, Can.
- Sherbrooke Mach. Co., Ltd , Sherbrooke, Que.
- Voith, J. M., New York, N.Y.

Rags
- Walker, J. R. & Co., Montreal, Can.

Recording Gauges
- Schaeffer & Budenberg, Brooklyn, N.Y.

Recording Thermometers
- Schaeffer & Budenberg, Brooklyn, N.Y
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Chambers Ltd., 152 Bay Street, Toronto.
- Marx, J. & Co., London, E.C., England.
- Process Engineers, Ltd., Montreal, Canada.
- Rice, Barton & Falls Mach. & Iron Co., Worcester, Mass.
- Voith, J. M., New York, N.Y.
- Waterous Engine Works Co. Ltd., Brantford, Can.

Rope Blocks
- Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Rosin Size
- Fox, Stockell & Co., London, Eng.
- Paper Makers Chemical Co., Easton, Pa.
- Process Engineers, Ltd., Montreal, Canada.
- Vera Chemical Co., North Milwaukee, Wis.
- Wilson-Paterson Co., Board of Trade Bldg., Montreal, Can.

Rosin Size Boilers and Dissolvers
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Process Engineers, Ltd. Montreal, Can.

Rotary Sulphur Furnaces
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Canadian Pulp Mill Machinery Co., Montreal, Can.
- Stebbins Engineering and Manufacturing Co., Watertown, N.Y

Runways—Hand operated
- Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Save-Alls
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
- Waterous Engine Works Co., Ltd., Brantford, Can.

Self Landing, Self Delivery Hoists
- Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Screen Plates
- Bertrams Ltd.. Edinburgh, Scotland.
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Chambers Ltd., 152 Bay Street, Toronto.

Screens
- Bertrams Ltd., Edinburgh, Scotland.
- Bezner, Albert, 299 Broadway, New York City
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Chambers Ltd., 152 Bay Street. Toronto.
- Glens Falls Mach. Wks., Glens Falls, N Y
- Harmon Machine Co., Watertown, N.Y.
- Jenckes Machine Co., Sherbrooke, Que.
- Johnson, Chas., St. Henry, Que.
- Marx & Co., J., London, England.
- Process Engineers, Ltd., Montreal, Canada.
- Sherbrooke Mach. Co. Ltd . Sherbrooke. Que
- Tippet Arthur P. & Co., Montreal, Cau.
- Voith, J. M., New York, N.Y.
- Voith, J. M., Wurtemberg, Germany.
- Waterous Engine Works Co. Ltd., Brantford, Can.
- Westbye, P. P., Peterboro, Can.

Shear Legs
- Morris, Herbert, Hoist & Crane Co., Toronto, Ont.

Slings
- Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Slitters and Re-Winders
- Bertrams Ltd.. Edinburgh, Scotland.
- Boving & Co., of Canada, Limited. Toronto, Ont.
- Cameron Machine Co., Brooklyn, N.Y.
- Chambers Ltd., 152 Bay Street. Toronto.
- Moore & White Co., Philadelphia, Pa.
- Ticonderoga Machine Works, Ticonderoga, N.Y.

Smelting Furnaces
- Boving & Co., of Canada, Limited, Toronto, Ont.

Straw Cutters'
- Bertrams Ltd., Edinburgh, Scotland.
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Chambers Ltd., 152 Bay Street, Toronto.

Straw Dusters
- Bertrams Ltd., Edinburgh, Scotland.
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Chambers Ltd., 152 Bay Street, Toronto.

Straw Digesters
- Boving & Co., of Canada, Limited, Toronto, Ont.

Strawboard Making Machines
- Bertrams Ltd., Edinburgh, Scotland.
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Chambers Ltd., 152 Bay Street, Toronto.

Steam Regulator
- Pickles, W. F., Buckland, Conn.

Stuff Chests
- Boving & Co., of Canada, Limited, Toronto, Ont.

Suction Couch
- Process Engineers Ltd., Montreal, Can.

Sulphite Mill Equipment
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Carthage Machine Co., Carthage, N.Y.
- Process Engineers Ltd., Montreal, Can.
- Stebbins Engineeringand Manufacturing Co., Watertown, N.Y

Sulphate Mill Equipment
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Carthage Machine Co., Carthage, N.Y.
- Process Engineers Ltd., Montreal, Can.

Sulphur
- Union Sulphur Co., 17 Battery Place, New York, N.Y.

Sulphur Burners
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Carthage Machine Co., Carthage, N.Y.
- Glens Falls Machine Works, Glens Falls, N.Y.
- Stebbins Engineering and Manufacturing Co. Watertown, N.

Tachometers (Hand and Stationary)
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Schaeffer & Budenberg, Brooklyn, N.Y.

Track Systems
- Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Tanks
- Canadian Allis-Chalmers, Ltd., Toronto, Ont.
- Boving & Co., of Canada, Limited, Toronto, Ont.
- Hamilton, Wm , Co., Peterboro, Can.
- Jenckes Machine Co., Sherbrooke, Que.
- McDougall, John, Caledonian Iron Works, Montreal, Can

Thermometers
- Schaeffer & Budenberg, Brooklyn, N.Y.

Transmission Machinery
- Caldwell, H. W. & Son Co., Chicago, Ill.
- Canadian Allis-Chalmers, Limited. Toronto.
- Boving & Co., of Canada, Limited, Toronto
- Jones & Glassco, Montreal, Can.

Traveling Cranes
- Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

Trolleys

MILL SUPPLIES---Continued

Turbines
Boving & Co., of Canada, Toronto, Ont.
Canadian Allis Chalmers, Ltd.. Toronto, Ont.
Smith, S. Morgan Co., York, Pa.
Voith, J. M. Co., Inc. New York, N.Y.
Voith, J. M., Wurtemberg, Germany.

Water Wheels
Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Hamilton, Wm. Co., Ltd., Peterboro, Can.
Smith, S. Morgan Co., York, Pa.
Voith, J. M., New York, N.Y.

Wire Cloth for Paper Machines
Chambers, Ltd., Toronto.
Christie, Geo., Ltd., Glasgow, Scotland,
Johnson, C. H. & Sons, Ltd., St. Henry, Montreal, Que
Kufferath, Andreas, Mariaweiler, Germany.
Tippet, Arthur P. & Co., Montreal, Can.
Taylor, J. A., Montreal, Can
United Wire Works, Ltd., Edinburgh, Scotland.
Westbye, P. P., Peterboro, Can.

Waste
Hough, R., London, England.

Wet Machines
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Glens Falls Machine Works, Glens Falls, N.Y.
Hamilton, Wm. Co., Peterboro, Can.
Norwood Engineering Co. of Canada, Ltd., Cowansville. P.Q.
Process Engineers, Ltd., Montreal, Canada.
Sherbrooke Machinery Co., Sherbrooke, Can.
Voith, J. M., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford Ont.

Woo Preparing Machinery
Benzer, Albert, 299 Broadway, New Yord City

PULP AND PAPER MILL PRODUCTS

This aims to be a complete list of the products of Canadian Pulp and Paper Mills, who are urged to send us lists of brands and watermarks, as well as the headings under which they wish to be indexed. Buyers who cannot meet their requirements from this list, are invited to communicate with the editor, who is in close touch with the mills, and will gladly furnish full information.

PULP MILLS

Ground Wood Pulp

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
Basin Electric Light & Power Co., Ltd., Montmagny, Que.
Beaver Co. Ltd., Thorold, Ont.
Belgo-Canadian Pulp & Paper Co., Shawinigan Falls, Que.
Brompton Pulp & Paper Co., Brompton and E. Angus, Que.
Booth, J. R. Ottawa, Ont.
Bronson Co., Ltd., Ottawa, Ont.
Clyde River Pulp & Paper Co., Ltd., Liverpool, N.S.
Colonial Wood Products Co., Ltd., Thorold, Ont.
Campbell Lumber Co., Weymouth, N.S.
Canada Paper Co., Ltd., Montreal, Que.
Chicoutimi Pulp Co., Chicoutimi, Que.
Compagnie de Pulpe de Dalmas, Dalmas, Que.
Davy, James, Thorold, Ont.
Eddy Co., The E. B., Ltd., Hull, Que.
East Canada Power & Pulp Co., Ltd., Nairn Falls, Que.
Foley-Rieger Pulp & Paper Co., Ltd., Thorold, Ont.
Ford, J. & Co., Port Neuf, Que.
Jacques-Cartier Pulp & Paper Co., Montreal.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
La Cie de Metabetchouan, St. Andre, Que.
La Havre Pulp Co., Ltd., Bridgewater, N.S.
Lake Megantic Pulp Co., Lake Megantic, Que.
Laurentide Co., Ltd., Grand Mere, Que.
MacLaren Co., Ltd., The James, Buckingham, Que.
McLeod Pulp Co., Ltd., Liverpool, N.S.
News Pulp & Paper Co., Ltd., St. Raymond, Que.
Nicolet Falls Pulp & Lumber Co., Nicolet Falls, Que.
North Shore Power, Railway & Navigation Co., Clarke City.
Northumberland Paper & Electric Co., Campbellford, Ont.
Nova Scotia Wood & Pulp Co., Ltd.. Mill Village, N.S.
Ontario Paper Company, Thorold, Ont.
Ouiatchouan Falls Paper Co., Ouiatchouan Falls, Que.
Powell River Co., Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que'
Price-Porritt Pulp & Paper Co., Rimouski, Que.
Reed, A. E. & Co., (Nfld.), Ltd., Bishop's Falls, Nfld.
River-du-Loup Pulp Co., Ltd., Fraserville, Que.
Soucy, F. Florentine, Old Lake Road, Que.
Spanish River Pulp and Paper Mills, Ltd., Espanola, Ont., Sturgeon Falls, Ont., Toronto, Ont., and Sault Ste. Marie, Ont.
St. George Pulp and Paper Co., St. George, N.B.
Thorold Pulp Co., Ltd., Thorold, Ont.
Trent River Paper Co., Ltd., Frankford, Ont.
Union Bag & Paper Co., Cape Madeleine, Que.
Trent Valley Paper Mills, Glenmiller, Ont.
Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Q

Kraft

Brompton Pulp & Paper Co., East Angus, Que.
Dryden Timber and Power Co., Dryden, Ont.
New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
Quebec and St. Maurice Industrial Co., La Tuque, Que.
Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que

Soda Fibre

Canada Paper Co., Ltd., Montreal and Toronto.
Dominion Paper Co., Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.

Sulphite Fibre

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
Booth, J. R., Ottawa, Ont.
Dominion Pulp Co., Ltd., Chatham, N.B.
Edward Partington Pulp & Paper Co., Ltd., St. John, N.B.
Eddy Co., The E. B., Ltd., Hull, Que.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Lake Superior Paper Co., Ltd., Sault Ste. Marie, Ont.
Powell River Co., Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que.
Riordan Pulp & Paper Co., Ltd., Montreal, Que.
Spanish River Pulp and Paper Mills Ltd., Sturgeon Falls, Ont., and Sault Ste. Marie, Ont.
Swanson Bay Forests, Wood, Pulp & Lumber Mills, Ltd., Swanson, Bay, B.C.
Toronto Paper Mfg. Co., Ltd., Cornwall, Ont.

PAPER MILLS

Bag

Eddy, The E. B. Co., Ltd., Hull, P. Q.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
Ford, J. & Co., Port Neuf.
Wilson, Ltd., J. C., 61 St. Alexander Street, Montreal, Que.
Jonquiere Pulp Co., Jonquiere, Que.

Binders' Board

McArthur. Alex. & Co., Montreal.
Northumberland Paper and Electric Co., Campbellford, Ont.

Blotting

Canada Paper Co., Montreal, Que., "Velvet Blotting."

Board

See Wood Board and Cardboard Specials.

Bond

Canada Paper Co., Ltd., Montreal, Que. "Burmese Bond," "St. Lawrence Bond," "Canada Bond," "Burmese Linen Ledger," "Windsor Mills Special." "Silverstream," "Springvale," "Super Writing," "White Railway," "Railway Manilla."
Howard Smith Paper Mills. Ltd., Montreal & Beauharnois, Que.
Kinleith Paper Co., Ltd., St. Catharines, Ont.
Rolland Paper Co., St. Jerome, Que., Mount Rolland, Que. and Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Book and Litho

Canada Paper Co., Ltd., Montreal, Que. "Art Photo Book," "Tinted Art Book," "Art Chromo," "English Book," "Satin Book," "Satin Litho," "Litho Label," "Super S. C. Book," "Standard S. C. Book," "Windsor Book."
Eddy Co., The E. B. ,Ltd., Hull, Que.
Kinleith Paper Co., Ltd., St. Catharines, Ont.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Box Board

See Wood Board and Cardboard Special .

Dominion Timber Regulations

Licenses to cut timber on Dominion Lands in the Provinces of Manitoba, Saskatchewan, and Alberta, the Northwest Territories, within twenty miles on either side of the main line of the Canadian Pacific Railway in the Province of British Columbia, and in the tract of three and one-half million acres to be located by the Government of the Dominion in the Peace River district in the Province of British Columbia, lying east of the Rocky Mountains and adjoining the Province of Alberta, shall be disposed of by public auction at the office of the Dominion Timber Agent for the district in which the berths are situated.

Before any parcel of timber is offered for sale it shall be surveyed by a duly qualified Dominion Land Surveyor into berths of an area not exceeding twenty-five square miles, and each of such berths shall then be thoroughly cruised by a duly qualified timber cruiser in the employ of the Dominion Government. The Minister shall then fix an upset price at which the berth shall be disposed of, and no berth shall be sold at less than the price so fixed.

Purchases to the amount of one thousand dollars or under shall be paid in cash at the time of sale. Purchases over one thousand dollars and not exceeding five thousand dollars shall be paid, one-half in cash at the time of sale, and a note or notes shall be given for the remaining half of the purchase price, payable in three months, with interest at the rate of five per cent. per annum. Purchases over five thousand dollars and not exceeding ten thousand dollars shall be paid one-third in cash at the time of sale, and notes shall be given for the remaining two-thirds of the purchase price, payable in three and six months, with interest at the rate of five per cent. per annum. Purchases exceeding ten thousand dollars shall be paid one-fourth in cash at the time of sale, and notes shall be given for the remaining three-fourths of the purchase price, payable in three, six and nine months, with interest at the rate of five per cent. per annum. Notes shall be made payable at a bank in the city or town in which the sale is held or at a bank in the city of Ottawa. Cash payments must be made at the time of sale in legal tender or by an accepted cheque on a chartered bank, or by a draft issued by a chartered bank, payable to the order of the Deputy Minister of the Interior. If default is made in any payment required by this section the sale shall be forfeited and void.

The purchaser must also pay the cost or the estimated cost of the survey of the berth before a license is issued.

The licensee shall pay an annual ground rent of five dollars per square mile except for lands situated to the west of Yale, in the Province of British Columbia, in which case the yearly ground rent shall be five cents per acre.

The licensee shall pay the following dues on timber cut on his berth:—

Sawn lumber, 50 cents per thousand feet, board measure.

Railway ties, eight feet long, 1½ cents each.

Railway ties, nine feet long, 1¾ cents each.

Shingle bolts, 25 cents per cord.

And 5 per cent. on the sale of all other products of the berth.

Timber Permits

Yearly permits are granted to settlers, mine operators and others on application to the Dominion Timber Agents, from whom further information can be obtained.

W. W. Cory
Deputy Minister.

Department of the Interior, Ottawa,
December 20th, 1912.

PAPER MILLS---Continued

Bristol

Don Valley Paper Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.
Canada Paper Co., Montreal & Toronto, "King Bristol," "Windsor Bristol," "C. P. S.Tinted Bristol," "Canada Bristol."

Building and Sheathing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que.
British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
Eastern Paper Co., Ltd., St. Basile, Que.
Montreal Paper Co., St. Basil, Que.
Northumberland Paper and Electric Co., Ltd., Montreal.
Riordon Pulp and Paper Co., Ltd., Montreal, Que.
Western Paper Mills, Ltd., Vancouver, B.C.
Jonquiere Pulp Co. Ltd., Jonquiere, Que.
Ford, R. & Son, Port Neuf, Que.
Laurentide Co., Ltd., Grand Mere, Que.
McArthur, Alex. & Co., Montreal, Que.
McLeod Pulp Co., Ltd., Liverpool, N.S.
Walker, J. R. & Co., Montreal, Que.

Cardboard Specials

Hinde & Dauche Paper Co., Ltd., Toronto, Ont.
Jonquiere Pulp Co., Jonquiere, Que.
Macleod Pulp Co., Ltd., Liverpool, N.S.
Canada Paper Co., Windsor Mills, Que. "Victor Printers' Blanks," "Superior Translucent Bristol," " C.P.C. Coated Litho," "Superfine Litho Blanks."
Booth, J. R., Ottawa, Ont.
Eddy, E. B. Co., Ltd., Hull, Que.
Laurentide Co. Ltd., Canada Life Building, Montreal, Que.

Carpet Lining

Ford, J. & Co., Port Neuf Station, Que.
Montreal Paper Co., St. Basile, Que.
Northumberland Paper & Electric Co., Ltd., Campbellford, Ont.
Wentworth Paper Mills, West Flamboro, Ont.
Western Paper Mills, Ltd., Vancouver, B.C.

Coated

Ritchie & Ramsay, Toronto, Ont.
Georgetown Coating Mills, Ltd., Georgetown, Ont.
National Paper Co., Valleyfield, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.

Corrugated Paper

Lazier Paper Mills, Ltd., Belleville,
Hinde & Dauche Paper Co., Ltd., Toronto, Ont.

Cover

Canada Paper Co., Ltd., Montreal and Toronto, "Tinted Art Cover," "Derby Cover," "Fibrestoc Cover," "Cashmere Cover," "X Cover," "XX Cover."
Eddy Co., The E. B. Ltd., Hull, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Ritchie & Ramsay, Toronto, Ont.

Envelope

Don Valley Paper Co., Ltd., Toronto.
Kinleith Paper Co., Ltd, St. Catherines, Ont.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Felts

Bird, F. W. & Sons, Hamilton, Ont., and Pont Rouge, Que.
Eastern Paper Co., Ltd., St. Basile, Que
McArthur, A. & Co., Montreal, Que.
Ford, J. & Co., Port Neuf, Que.
Ford, R. & Son, Port Neuf Station, Que.
Montreal Paper Co., St. Basile, Que.
Northumberland Paper & Electric Co., Ltd., Campbellford.
Western Paper Mills, Ltd., Vancouver, B.C.

Fibre

Canada Paper Co., Ltd., Montreal and Toronto.
Dominion Paper Co., Montreal, Que.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
McArthur, Alex. & Co., Montreal, Que.
Riordon Pulp and Paper Co., Merritton, Ont.
Strathcona Paper Co., Strathcona, Ont.
Wilson, Ltd., J. C., Montreal, Que.

Flour Sacks

Eddy Co., The E. B., Ltd., Hull, Que.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
Wilson, J. C., Ltd , 61 St. Alexander Street, Montreal.

Glazed

Provincial Paper Mills Co., Ltd., Toronto, Ont.

Hanging

Lincoln Paper Mills Co., Ltd., Merritton, Ont.
McArthur, Alex. & Co., Montreal, Que.
Moira Paper Mills, Belleville, Ont.
Riordon Pulp and Paper Co., Ltd., Montreal, Que.
Strathcona Paper Co., Strathcona, Ont.

Kraft

Brompton Pulp & Paper Co. Ltd., East Angus, Que.
Dominion Paper Co. Ltd., Montreal, Que.
Dryden Timber and Power Co. Ltd., Dryden, Ont.
New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que.

Leather Friction Board

Walker, J. R. & Co., Montreal, Que.

News

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
Belgo-Canadian Pulp and Paper Co., Shawinigan Falls, Que.
Booth, J. R., Ottawa, Ont.
Canada Paper Co., Ltd., Montreal and Toronto, "Canada Brand."
Eddy Co., The E. B., Ltd., Hull, Que.
Ford, Joseph & Co., Port Neuf, Que.
Fort Frances Pulp & Paper Co., Ltd., Fort Frances, Ont.
Jonquiere Pulp Co., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Lake Superior Paper Co., Sault Ste. Marie, Ont.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
McArthur, Alex. & Co., Montreal, Que.
Miller Bros. Co., Ltd., Glenmiller, Oht.
News Pulp & Paper Co., Ltd., St. Raymond, Que.
Powell River Co. Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que.
Riordon Pulp and Paper Co., Ltd., Montreal, Que.
Spanish River Pulp & Paper Mills, Ltd., Toronto, Ont
Ontario Paper Co., Thorold, Ont.

Roofing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que
Ford, Joseph & Co., Port Neuf, Que.
Ford, Rowland and Son, Port Neuf, Que.
Montreal Paper Co., St. Bazile, Que.
Walker, J. R. & Co., 35 Common, Montreal, Que.
Western Paper Mills, Ltd., Vancouver, B.C.

Straw Board

Ford, J. & Co., Port Neuf, Que.
Lazier Paper Mills, Ltd., Belleville.
Lincoln Paper Mills Co., Ltd., Merritton, Ont
McArthur, A. & Co., Montreal, Que.
Moira Paper Mills, Belleville, Ont.
Northumberland Paper & Electric Co., Campbellford, Ont
Trent River Paper Co., Ltd., Frankford, Ont.
Trent Valley Paper Mills, Glenmiller, Ont.

Tag

Don Valley Paper Co., Ltd., Toronto, Ont.
Eddy, The E. B. Co., Ltd., Hull, Que.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
J. R. Booth, Ottawa, Ont.

Tissue and Toilet

Eddy Co., The E. B., Ltd., Hull, Que.
Garden City Paper Mills, Ltd., St. Catharines, Ont.
Interlake Tissue Mills, Ltd., Merritton, Ont.
Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Que

Wall Board

Beaver Co., Ltd., Beaverdale, Que.
Bishoprick Wallboard Co., Ottawa, Ont.

Wood Board

Beaver Co. Ltd., Thorold, Ont.
Booth, J. R. Ottawa.
Brompton Pulps Paper Co. Ltd., East Angus, Que.
Canada Paper Co., Montreal, Que.
Eddy Co., The E. B., Ltd., Hull, Que.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Northumberland Paper & Electric Co., Campbellford, Ont.
McLeod Pulp Co., Liverpool, N.S.
Western Paper Mills, Ltd., Vancouver, B.C.
Wilson, J. C., Ltd., 61 St. Alexander St., Montreal Que

Wrapping

Booth J. R., Ottawa, Ont.
Canada Paper Co., Ltd., Montreal and Toronto, "Scotch Fibre," "Invictus Fibre," Hercules Manilla," "St. Fancis Manilla," "Wave Crest Drug."
Dominion Paper Co., Montreal, Que.
Don Valley Paper Co., Ltd., Toronto, Ont.
Eddy Co., The E. B., Ltd., Hull, Que.
Ford, J. & Co., Port Neuf, Que.
Ford, Rowland, Port Neuf, Que.
Gore Valley Paper Mills, Dundas, Ont.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Canada Paper Co., Monreal and Toronto
See also Kraft.

Writing

Howard Smith Paper Mills Ltd., Beauharnois, Que.
Kinleith Paper Co. St. Catherines, Ont.
Rolland Paper Co., Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Manufacturing Co., Cornwall, Ont.

THE PROVINCE OF ONTARIO

is rich in timber, mineral, agricultural, and other resources.

Ontario has large areas of White Pine and other valuable timbers, her timber products last year representing one-third of the total output of Canada.

Ontario has pulpwood areas practically illimitable, and offers a great field for those desirous of embarking in the pulp and paper-making industry.

Ontario has innumerable waterfalls capable of supplying power for all manufacturing purposes, which are obtainable on reasonable terms, subject to development.

Ontario has large pulp and paper mills in operation at Ottawa, Sturgeon Falls, Spanish River Sault Ste. Marie and Dryden and large plants are under construction at Abitibi on the Temiskaming and Northern Ontario Railway, and Fort Frances on the Rainy River.

Ontario is traversed East and West by three great transcontinental railways, and North and South by three others.

For full particulars as to Ontario's great resources and the advantages offered for large wood-using industries apply to

Hon. W. H. Hearst
Minister of Lands, Forests and Mines
Toronto

Paper Mill Agents and Commission Merchants

Calgary, Alta.

Davis, W. D. & Co., 3rd Street, W., and 7th Avenue.
John Martin Paper Co., Ltd.
Tees & Persse.

Edmonton, Alta.

Tees & Persse.
John Martin Paper Co., Ltd.

Saskatoon, Alta.

Tees & Persse.

Vancouver, B.C.

Brake, Creedon Co., Ltd.
Mitchell Bros., 123 Cordova E.
Smith, Davidson & Wright.

Victoria, B.C.

Mitchell Bros., 8 Bastion.

Moose Jaw, Sask.

Tees & Persse.

Regina, Sask.

Tees & Persse.

Winnipeg, Man.

Barber & Ellis.
Clark Bros. & Co., Ltd., 143 Portage.
Ratcliffe Paper Co., Ltd.
Hudson Paper Co.
Kilgour Bros.
Martin, John, Paper Co., Ltd., 319 William.
McAllister & Watts.
McFarlane, Son & Hodgson, Bannatyne and Adelaide.
Tees & Persse.
John Martin Paper Co., Ltd.

St. John, N.B.

Schofield Paper Co., Ltd., 26-30 Prince William.

Moncton, N.B.

Reid, F. P. & Co.

Halifax, N.S.

Eastern Supply & Paper Co., 28 Bedford Row.
Latter, N., 104½ Windsor.
Allen, T. C. & Co.

New Glasgow, N.S.

McGregor, R. & Co.

Kingston, Ont.

Hendry, J. A., 875 Princess.

Hamilton, Ont.

Buntin, Gillies & Co., Ltd., John and Jackson.
Powis, A., 64 King E.

Ottawa, Ont.

Barnard, W. R., 374 Bank St.
Reid, C. De Wolf.

Port Arthur, Ont.

Tees & Persse.

Toronto, Ont.

Barber-Ellis Co., Ltd., 71 Wellington Street, W.
Brown Bros., Ltd., 51 Wellington Street, W.
Buntin, Reid Co., 13 Colborne.
Canada Paper Co., Ltd., 112 Bay Street.
Ratcliffe Paper Co., Ltd.
Fisher, E. W., 215 Victoria.
Gaine, T. & Son, 124 Richmond W.
Gage, W. J. Co., Ltd., 84 Spadina Ave.
Hodge-Sheriff Paper Co., McKinnon Building.
Howell, G. A. Co., 10 Wellington E.
Livingstone, H. E. & Co., 80 George.
McNairn, J. H., 5 Jarvis.
Thorne, A. M. & Co., 45 Colborne Street
Victoria Paper & Twine Co., Ltd., 415 King W.
Waters Bros., 33 Front E.
Whyte, Alex., 64 Wellington Street, W.
Wilkinson, E. H., Telephone Building.

Montreal, Que.

Dawson, W. V. & Co., 17 De Bresoles.
Dickinson, John & Co., Ltd., 216 Lemoine.
Little, T. B. & Co., 23 Cote.
Lloyd, Ed., Ltd., Eastern Townships Bank Building
McFarlane, Son & Hodgson, 14 St. Alexander.
Reid, C. DeWolf, Herald Bldg.
Robertson & Parker, St. Paul.
Rolland, J. B. & Son, 14 St. Vincent.
Smith, Howard, Paper Mills, Ltd., 138 McGill.

Quebec, Que.

Andrews, F. H. & Son, 64 St. Paul.
Rolland, J. B. & Son, 36 St. Paul.

Foreign

Salomon & Co., Felix, New York City,
Whitaker Paper Co., Cincinnati, Ohio.
Castle, Gotheil & Overton, New York, N.Y.
Churchill & Sim, Clements Lane, London, E.C., Eng.
Parsons Trading Co., 1 Battery Place, New York.
Pulp and Paper Trading Co., Temple Court Building, New York.
Scandinavian American Trading Co., New York, N.Y.

WANT AND FOR SALE

MILLWRIGHTS wanted for new Pulp Mill in Ontario; must be experienced in erection of machinery; state experience and wages required Abitibi Pulp and Paper Co., Ltd., Iroquois Falls, Ont.

WANTED—Experienced man for operating sheet cutter. Preference given to a man speaking both French and English. Belgo Canadian Pulp & Paper Co., Ltd., Shawinigan Falls, P.Q.

PULP & PAPERMAN—College graduate, wants position. Several years' experience as superintendent and general foreman in pulp mill. Last four years in construction and engineering office. Box 80, Pulp and Paper Magazine, Montreal.

FIRST-CLASS SULPHITE SUPERINTENDENT required for new mill under construction; state fully age, experience and salary required. Apply Box No. 85, Pulp & Paper Magazine, Montreal.

SUPERINTENDENT of experience wants position in mill making news, book, hanging, Manilla or specialties. Good on color and have good mechanical ability. References furnished.—S. W. K., Pulp and Paper Magazine, Montreal.

FOREMAN MACHINIST.—Thirteen years' all-round experience in construction and repairs, specialised on paper mill repairs for six years, five years' foremanship, desires similar position. Box 87, Pulp and Paper Magazine, Montreal.

WE ARE IN THE MARKET for several thousand Peeled Spruce Pulpwood. Write "Central," c-o Pulp & Paper Magazine, Montreal, giving location, quantity and price.

CHEMIST wants position with reliable company in investigation or control work. Understands pulp and paper manufacture. Five years' experience. Technical and engineering training. Any location. In replying give details as to requirements. Address, Paper Chemist, Pulp and Paper Magazine, Montreal.

WANTED—Four first-class Wet Machine and Grinder Foremen for new 200-ton Mill; state fully ages and salary required. Apply Box No. 86, Pulp & Paper Magazine, Montreal.

TECHNICAL GRADUATE, age 26, unmarried, with two years' experience in electro-chemical industry, desires a position with chance for advancement, accurate and reliable, best of references. Address Technical, Pulp and Paper Magazine, Montreal.

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AYERS LIMITED
Lachute Mills
P.Q.
Established
1870
FELTS
AYERS HIGH GRADE FELTS SATISFACTION GUARANTEED
For
Pulp and
Paper Mills

LAWRENCE PUMP & ENGINE CO.
P.O, Box 70, Dept. 10
LAWRENCE, MASS.
CENTRIFUGAL PUMPS

We make an exclusive specialty of High Efficiency Centrifugal Pumps for Paper and Pulp Mill. In one mill 49 of our Pumps are running, the customer writes—"Your Pumps are all giving perfect satisfaction.

Telephone 1700 1701 Broad Cable Address: "LAGERLOF NEW YORK"

Scandinavian-American Trading Company

PRODUCE EXCHANGE BUILDING - NEW YORK

IMPORTERS AND EXPORTERS OF

FOREIGN AND DOMESTIC

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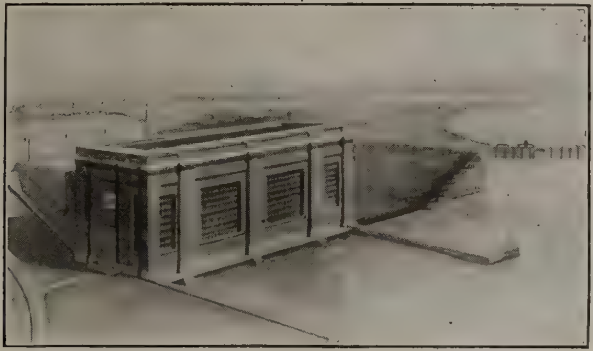

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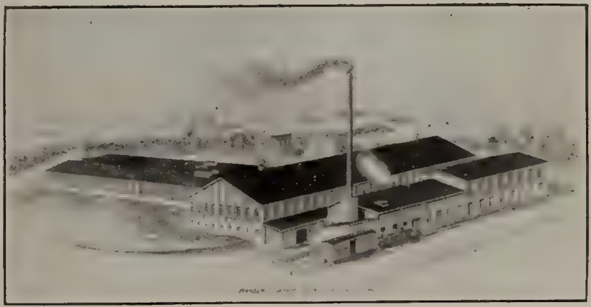

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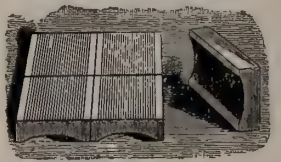

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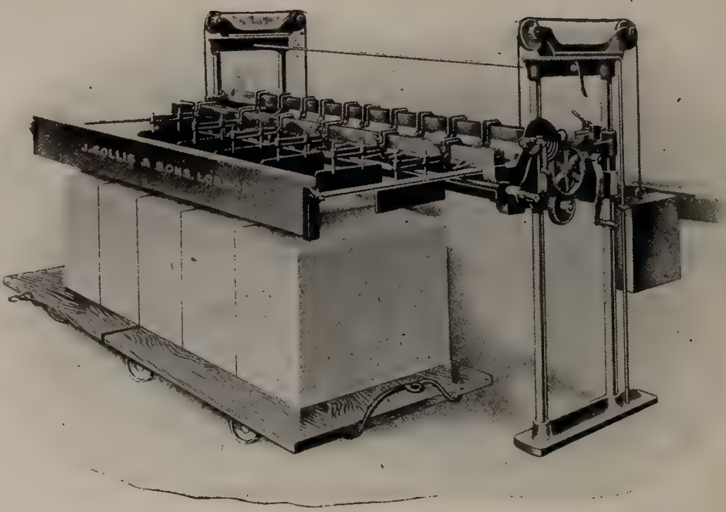

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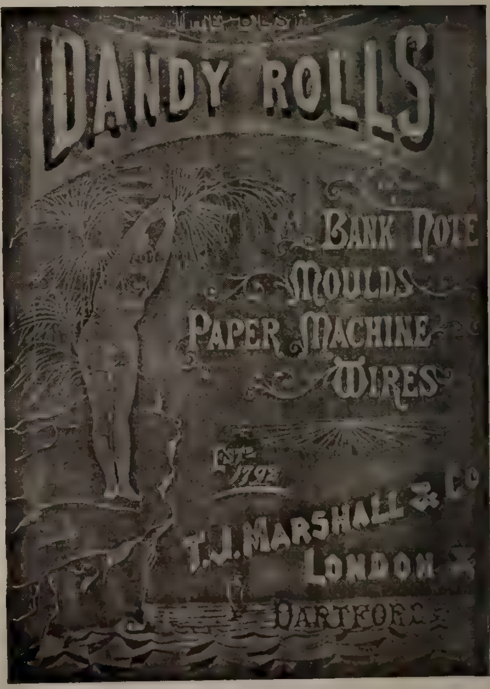

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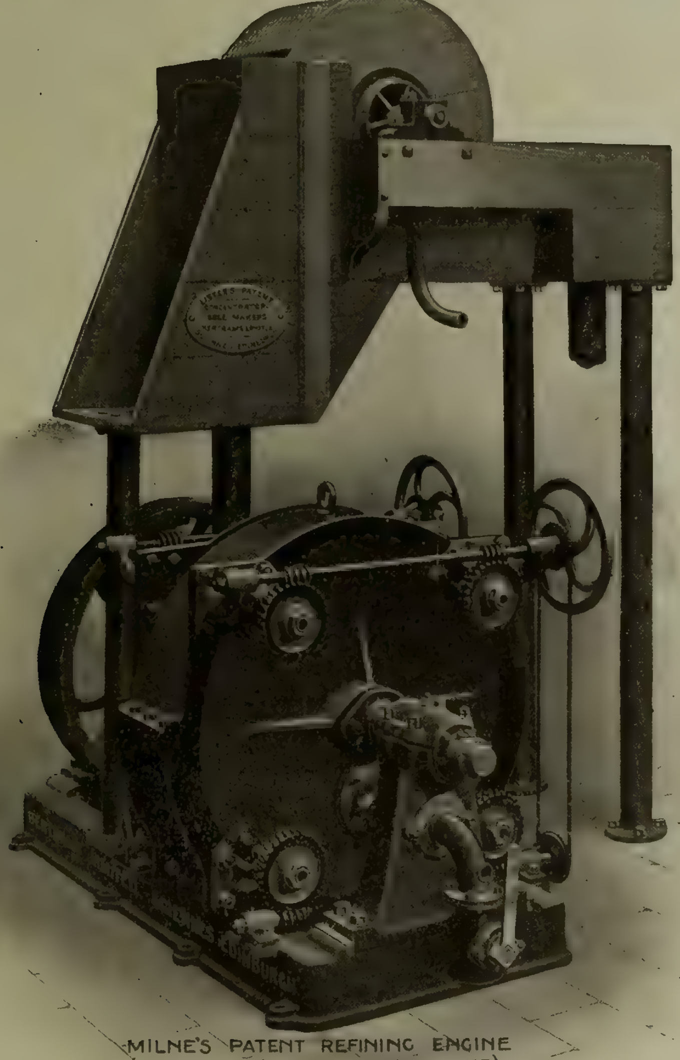

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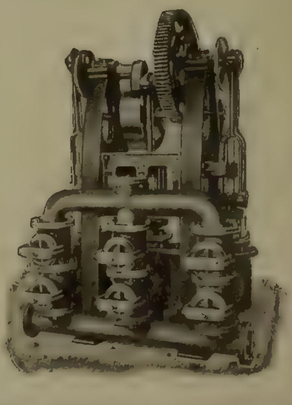

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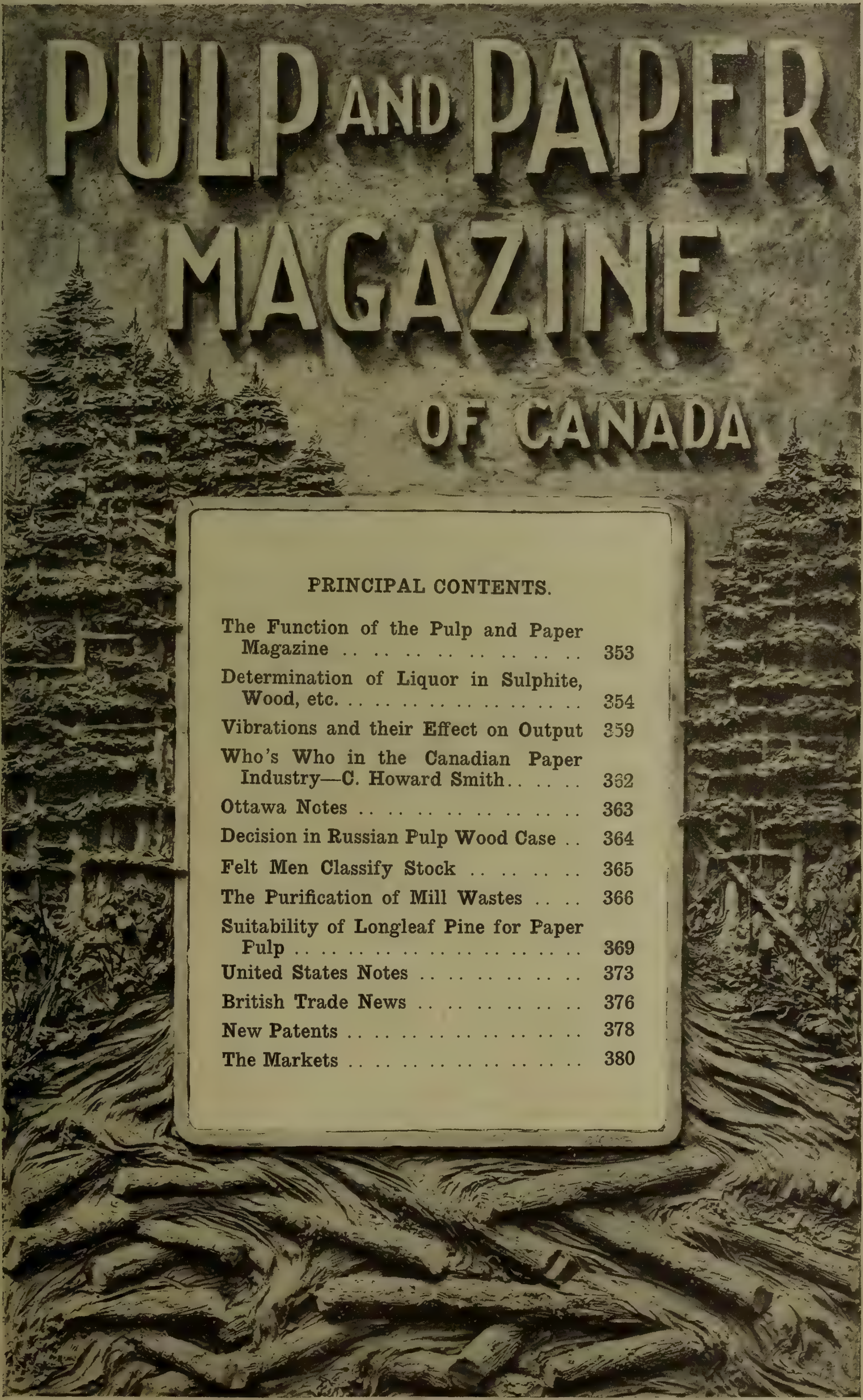

PULP AND PAPER MAGAZINE OF CANADA

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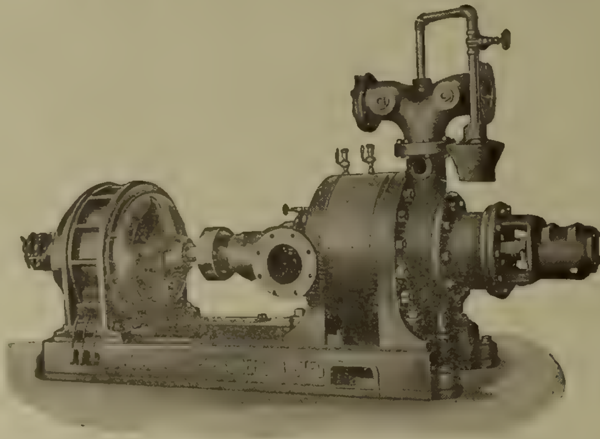

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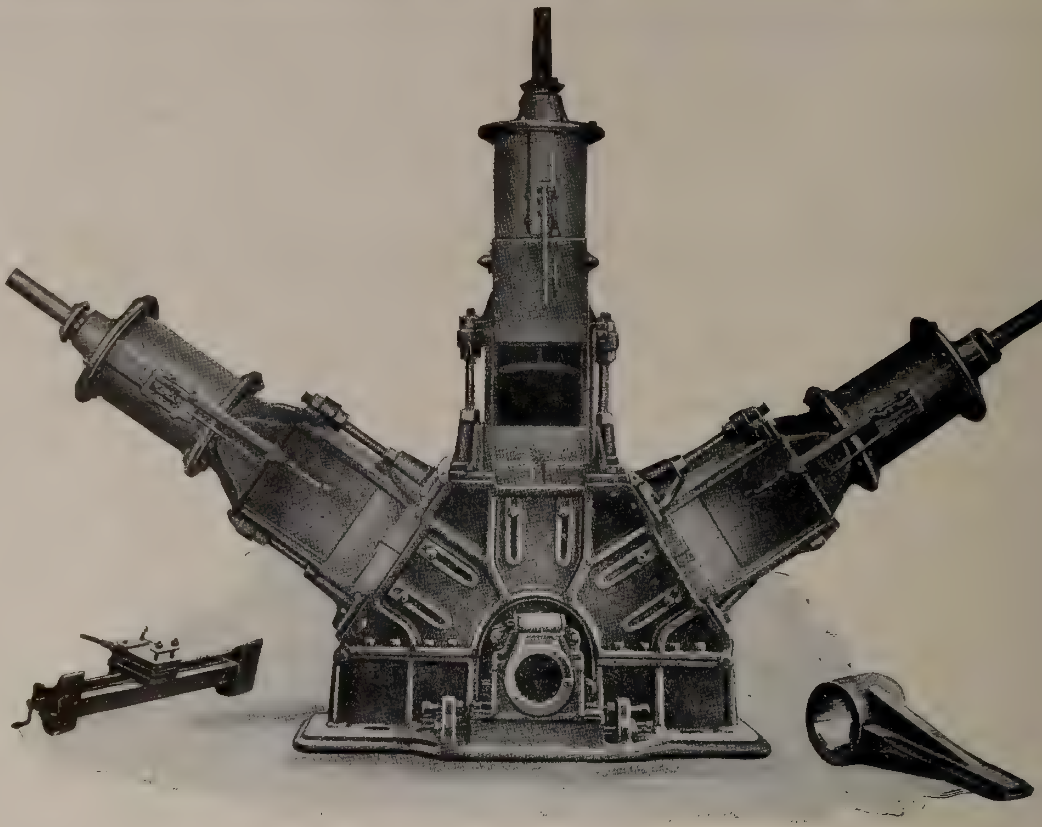

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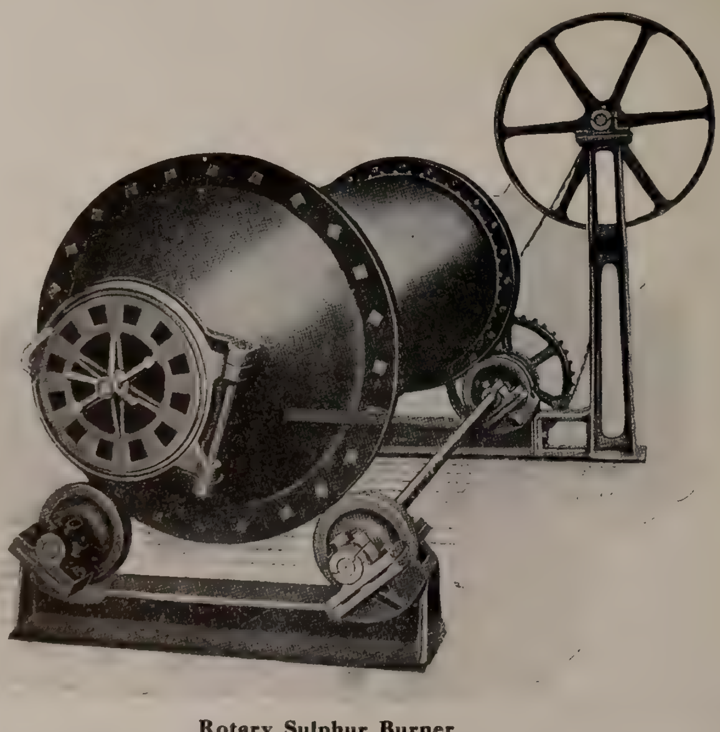

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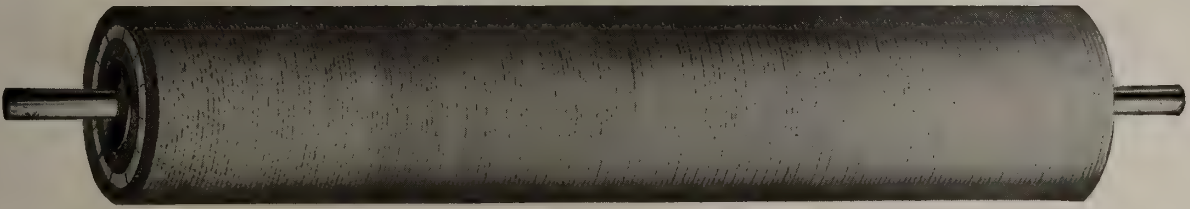

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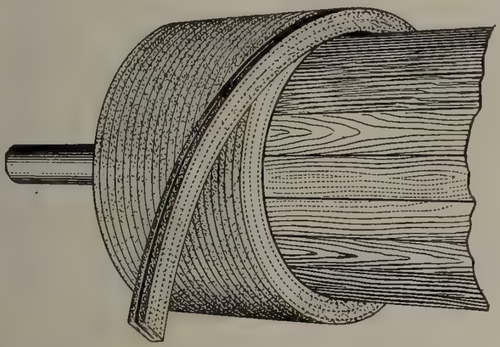

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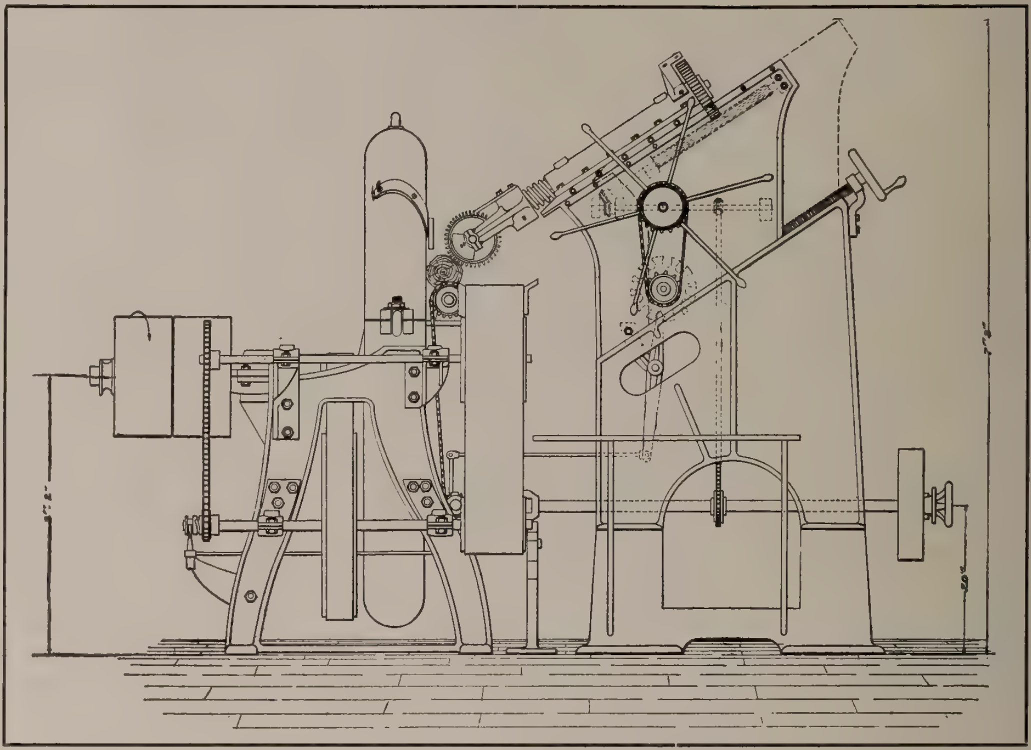

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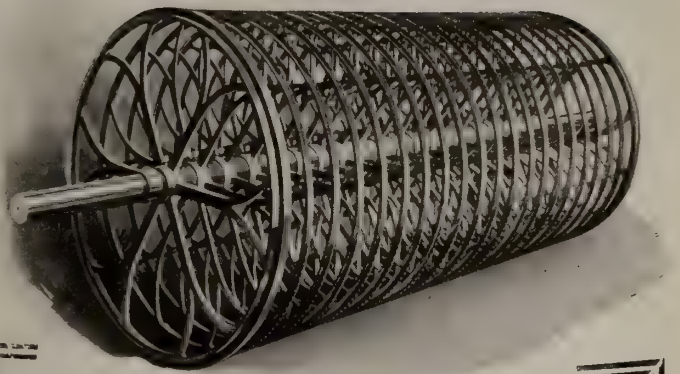

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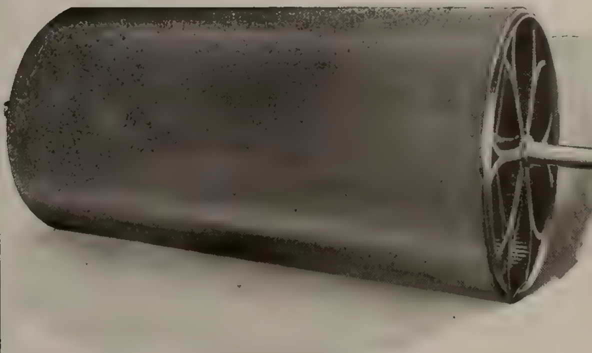

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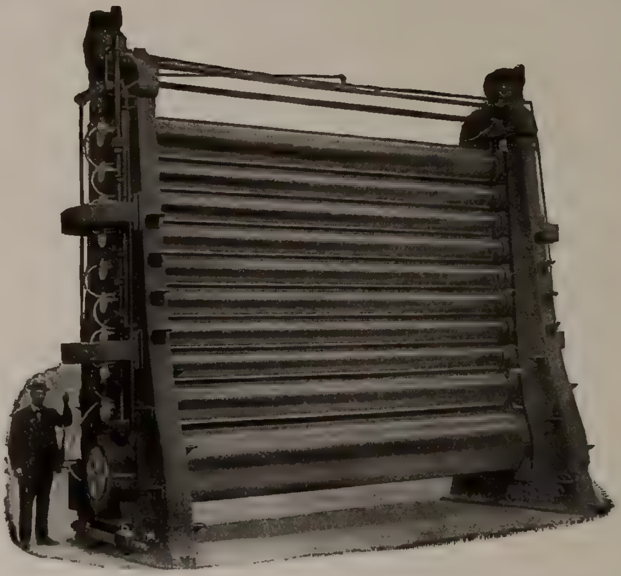

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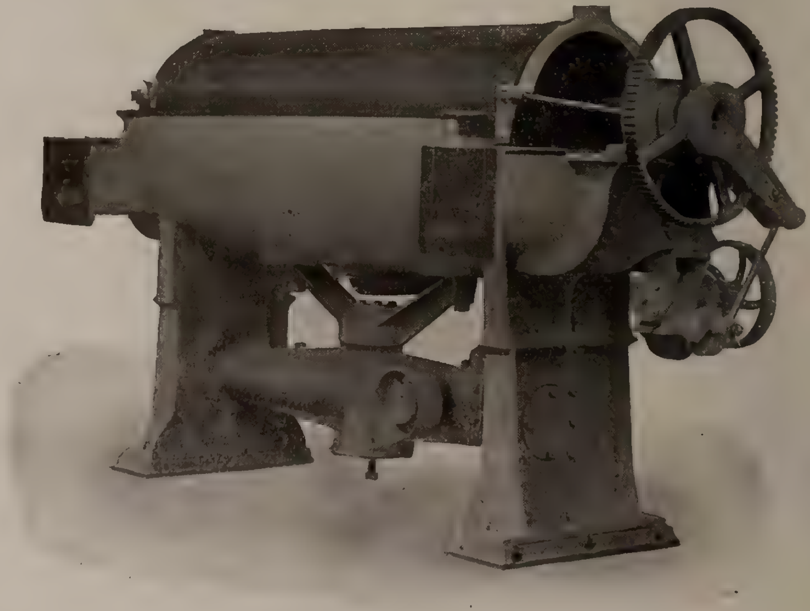

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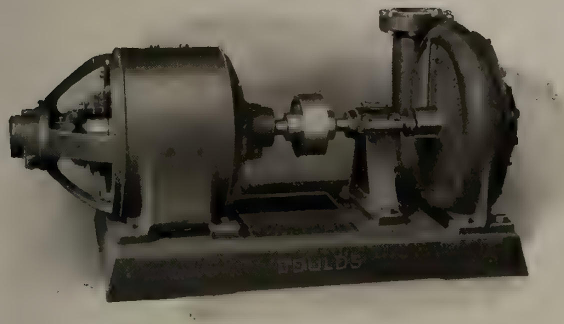

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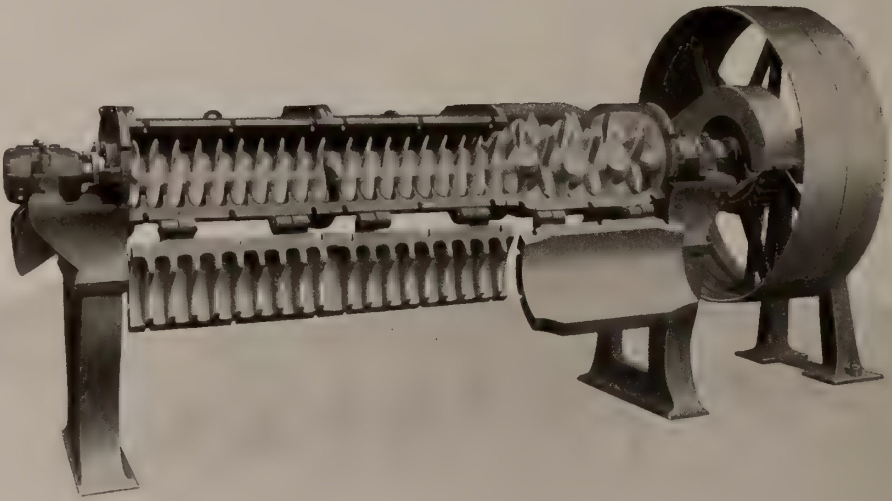

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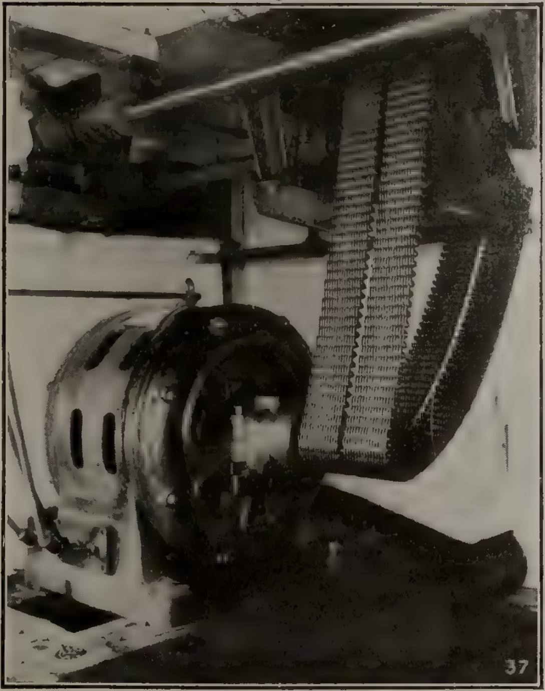

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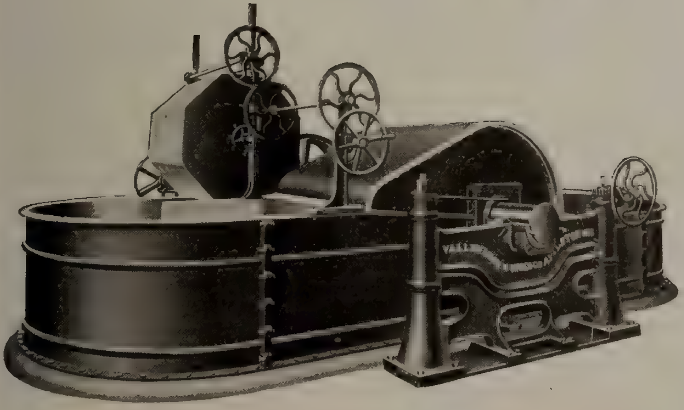

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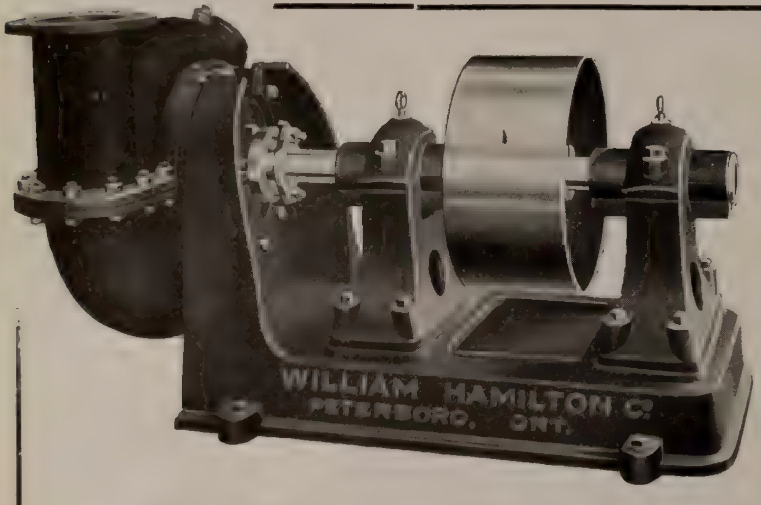

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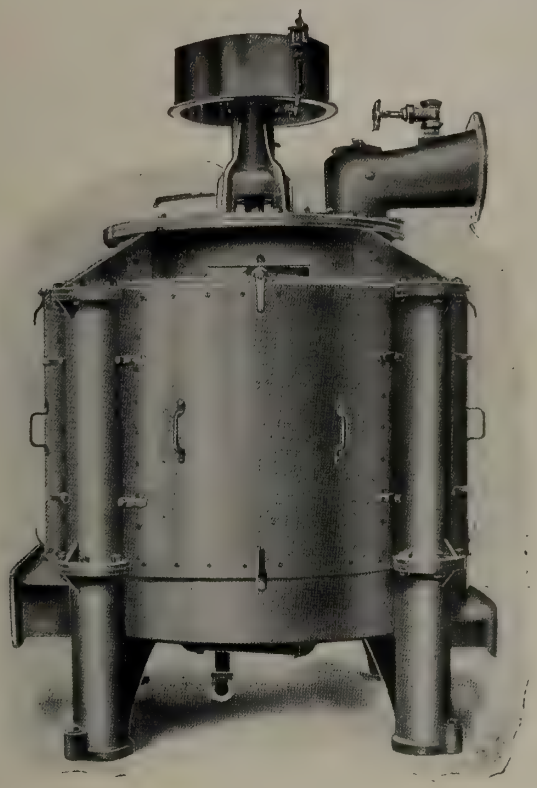

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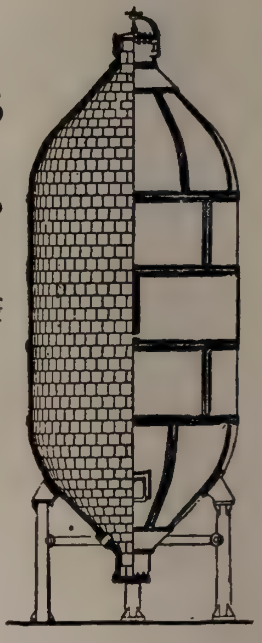

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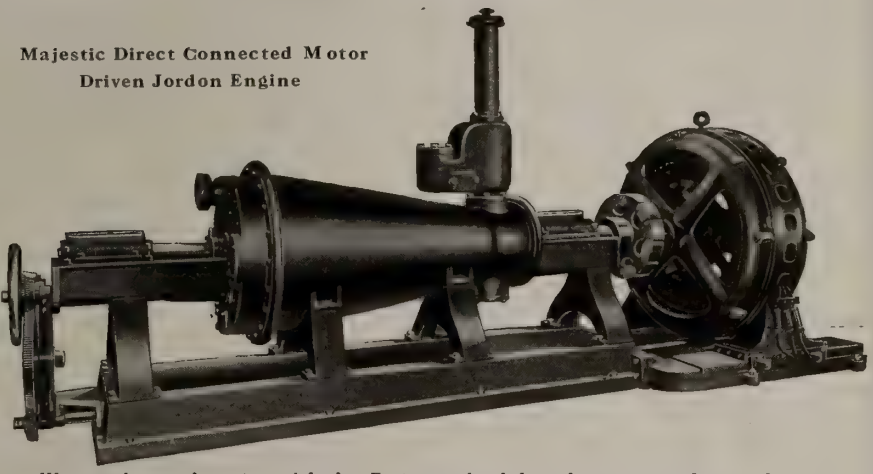

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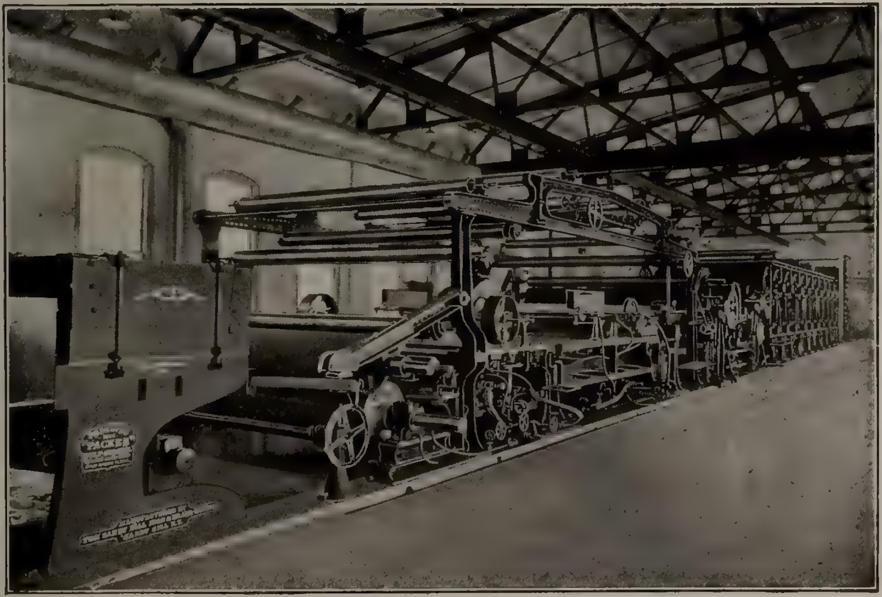

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The Function of the Pulp and Paper Magazine

The pulp and paper industry at the present time is undergoing tremendous changes. Within the last decade there has been in Canada an increase of ten fold, and in the last year there has been practically a doubling, of exports of paper. Next year, it is expected, there will be 30 per cent. more paper made in the Dominion than at present. Water powers are being developed, electrical transmission is being extended, and mills and machinery are being rapidly improved. When the skill of the individual paper maker has to be spread over hundreds of tons of product, where before he counted in units or tens, when hundreds instead of scores of men are employed in single mills, and when millions of dollars of capital are involved, there comes the urgent necessity to apply the most exact and invariable principles in the process of paper manufacture. Science, which is defined by some authorities as "classified knowledge," is entering at every point. The chemist, the hydraulic engineer, the heat expert, the wood technologist and many other men trained in particular branches of science are being found absolutely necessary to the conduct of the business. And among the foremost of the experts required is the man who has acquired in the dear school of experience that knowledge which is almost unteachable—the master paper maker.

Along with the development of experts in the various special lines there has come into modern industry a new principle,—or rather, there has been lent to a principle which had remained long unemphasized a new force and meaning. It is that co-operation pays. Men have found that, except in very rare instances, there is more money, more advancement to the industry and more comfort, happiness and uplift to be derived from being free and open with competitors than in holding close the benefit of their experience.

The annual convention has taken on a new significance. "Let's all get together once a year" is the spirit of practically every industry of size and importance in America. And these conventions mean much, not only in themselves, but in that they provide a stimulus for the whole year and raise the standard on every side. At a recent convention of the Canadian Forestry Association E. T. Allen, of the Western Forestry and Conservation Association, an organization which has made most spectacular and permanent success among the lumbermen, timber owners, government and public in the Coast States of the Union, said: "The man who doesn't come to these conventions is making a big mistake. He gets stranded in a little backwater and he misses the benefit of co-operation with his fellows."

The Canadian Pulp and Paper Association stands for co-operation among the producers in this country. It is taking the lead in bringing together the men whose knowledge and influence will shape the industry in the future. Canada's pulp and paper field is practically unlimited if the proper measures of conservation are adopted in the forest. To develop men thoroughly skilled in the art and business of pulp and paper manufacture and to secure co-operation among all whose interests lie in the industry are the two problems whcih lie before pulp men to-day.

It is in these two fields that the Pulp and Paper Magazine hopes to be of service. "A Convention All the Year Round" will be its motto.

Already a recognized medium throughout America and in Europe, this magazine will endeavor to develop along lines of highest usefulness to the industry. Leading paper makers, chemists and other experts, it is expected, will contribute regularly, and every effort will be made to keep the magazine up to the minute in all branches of research. Further, and most important, pulp and paper makers will find in these columns a series of articles and paragraphs embodying the actual experience of mill operators. It is hoped that every man who reads the magazine will accept a hearty welcome to use the Pulp and Paper Magazine for the purpose of giving to the industry that which he feels would be of interest. Said one well-known superintendent not long ago: "I want to know what the other fellow has found out, and I guess he wants to know what I have found out." From the log sorter and from the most expert chemist alike can come points which will be of profit and advantage.

Knowledge, experience and co-operation, as evidenced in these columns, it is hoped will provide the industry with "A Convention All the Year Round."

DETERMINATION OF LIGNIN IN SULPHITE WOOD, ETC.

By E. RICHTER, D.E., D.Sc.

(Specially Written for Pulp and Paper Magazine).

Quite a number of authors, among which are most prominent Cross and Bevan, Muller, Zeisel and Stritar, Schulze, Seidel, Klason, etc., have tried to find a quantitative analytical method to test raw material and finished product of the chemical pulp industry. Considering the benefit derived from methods allowing to check the processes and yields in other industries, it might be said that the energy spent was well worth the object and that in spite of many futile attempts, the results obtained so far are of the greatest value to the pulp maker, as well as to the paper maker.

The methods to test the percentage of pure cellulose in wood or other raw material and in such finished product as in Sulphite or Soda-pulp in general, can be divided into two classes: (1) Methods through which pure cellulose or fibre substance is isolated; and (2), methods which are also based on the inactivity of the cellulose against chemical re-agents, but which determine directly only the impurities, leaving the pure fibre material more or less unattacked. Naturally, wherever possible, a direct method is to be preferred, however, in the case of chemical pulp, the chance of separating pure cellulose in a short time without loss is very small. On the other hand, we know less of the chemical nature of the impurities or lignin matter, and it is therefore obvious that these indirect testing methods are empirical and are only valuable if they can be proved to give good results under different conditions and with different material.

Among other direct ones, Cross and Bevan introduced three indirect methods to determine the cellulose in chemical pulp or paper and, having had some experience with two of them and the one proposed by Hempel and Seidel, the author will give a short account of the results obtained and the efforts made to check them with other direct determinations, using different raw materials

The methods used by Cross and Bevan, as described in Textbook of Papermaking, are the following:

1. The weighed substance is moistened somewhat and exposed to the action of pure chlorine gas. After a certain time the excess chlorine is expelled, water is added and the hydrochloric acid formed is titrated with soda solution. Cross and Bevan claim that a certain amount of chlorine is reduced to hydrochloric acid through the influence of the impurities and that this amount is equivalent to the lignin contained in the sample. They also give some experiments with a few pulp samples, which seem to show the suitability of this method. They are not considering the influence of light and moisture on the chlorine itself. It is well known that chlorine exposed to light and moisture will form hydrochloric acid. It would be therefore at least necessary to exclude light; but even then, small quantities of the acid are formed, of course less the more the light is shut off from the experiment. This is, however, only one theoretical objection to the proposed method. Another practical one is the following: If the material is finely divided as is obviously necessary, the chlorine will be absorbed and absorbed by the fibres and cannot be expelled entirely without heating.

2. The second method used by Cross and Bevan is the determination of the iodine absorbed by the sample from aqueous solutions. This method is similar to those used in the oil industry, and, judging from the latter, it stood a good chance of solving the problem. Practical experiments, however, proved it to be a failure with chemical pulp.

3. The third method which was used for comparison by the author was one first proposed and tried by Hempel and Seidel. The experiments with this kind were rather difficult at the beginning, having the disadvantage of requiring a somewhat elaborate apparatus. Yet the first tests seemed to warrant a further study about it and with a small change in the conditions under which the tests were made, very satisfactory results could be obtained.

Some of the determinations of lignin with Cross and Bevan's methods and Hempel and Seidel's form follow:—

Sulphite per 10 grs. Substance formed or absorbed.

No.	Grs. Hydrochloric acid.	Grs. Iodine.	Grs. Nitrous Acid N_2O_3
1	0.215	0.241	0.143
2	0.482	0.325	0.299
3	0.365	0.181	0.161
4	0.621	0.269	0.205
5	0.234	0.219	0.198
6		0.034	0.114
		0.175	
		0.174	

The substance used in all tests was sulphite, the author not having the opportunity to experiment with different samples of soda pulp.

In regard to the practical work with the three methods, the following may be said: 1. Cross and Bevan chlorine method—About 2-5 grs of substance were brought into a Erlenmeyer flask, and spread over the bottom in small particles Having moistened the cellulose with steam, well purified chlorine was introduced slowly, for about fifteen minutes. The current of chlorine gas was then replaced by one of dry air. Having removed the former as well as possible, water was added and the solids filtered off. The solution was titrated with 1-10 normal alkaline and the hydrochloric acid formed, was figured from the amount of alkali used. It need not be said that the flask was kept well in the dark, as long as free chlorine was present.

2. Cross and Bevan, Iodine method.—About one gr. (occasionally up to 3 grs.) were put in a 1,000 cc. bottle with glass stopper, 25 or 50 cc. of 1-10 normal aqueous solution of iodine added and, having closed the bottle, it was left in a dark place for about 12 hours. After this time the excess of iodine was titrated with 1-10 normal hyposulphite solution. The balance being the iodine absorbed by the lignin substances.

3. Hempel and Seidel's method was used in the form these authors described it, with the exception that 5 grs. instead of 10 grs. sulphite were used per 100 cc. of 13 per cent. nitric acid, as it was found that a smaller quantity of substance was much more convenient. Since it may be rather hard to find the original publication from Hempel and Seidel, I take the liberty of giving a short description of the apparatus and the working of it.

Five grams of sulphite are well broken up and put in a so-called Drechslers wash bottle, together with 100 cc. of nitric acid. 13 per cent.). The bottle with substance is then inserted in a water bath, where it can be heated to 100° C. At the same time air is drawn through material and liquid by a suction pump. The gases evolved, mainly nitrogen oxide (NO), nitrous acid anhydrid (N_2O_3), nitrogen tetroxide (N_2O_4), some nitrogen, etc., are forced through a bulb with water, then through a long vertical absorption tube, entering at the bottom and leaving at the top, while water runs in the opposite direction, it being collected at the bottom. This is followed by a Peligot tube with little water. These three absorption apparatus serve to absorb the nitrous acid gas, while some nitrogentrioxyd might pass them. In order to collect it, too, ogygen is added from a suitable gas holder and the gases drawn through more Peligot-tubes filled with concentrated sulphuric acid

Having assembled all the glass parts in the proper way, a test is run in the following manner:—First, the draught is put on and the water bath heated slowly. The temperature of it should rise to the boiling point of the water in about 15 minutes. From that time it is kept boiling for exactly one hour, increasing the air draught somewhat towards the end of the experiment. The aqueous solution from the first three apparatuses is then collected in a 1000 cc. flask while the sulphuric acid which served also for absorption purposes, is kept separate in a graduated 250 or 500 cc bottle. The first solution is now titrated with 1-10 normal alkali, thus testing the total acidity, and further with 1-10 normal potassium permanganate solution having some sulphuric acid present. The last titration gives the amount of nitrous acid. According to Lunge, it should be done in such a way that the solution to be tested is filled in a burette from which it runs into the measured amount of permanganate at about 40° C. The sulphuric acid solution is titrated with permanganate only. All results are expressed by some standard, either as nitrogen or as nitrogenous acid (N_2O_3). The different amounts of one or the other, figured on 10 grs. pulp, are then equivalent to the contents of lignin in sulphite. This method at first looks to be inconvenient and laborious; however, if the apparatus is put up once and the standard solutions are made, a test does not take much more than 1½-2 hours. An example may be given how to figure the resp. amount of nitrous acid gas.

1. Aqueous solution, 1000 cc.
2. Sulphuric acid solution, 250 cc.
1. a. 50cc used 6.8 cc 1-10 normal alkali
and b. 29.4 cc were used for 5.0 cc of permanganate
c. 1.0 cc of the permanganate equalled 0.00022 grs. N_2O_3.
a. This is equal to 0.0762 grs. KOH per 1000 cc
b. This is equal to 0.0374 grs N_2O_3 per 1000 cc

Acording to the equation $\frac{N_2O_3}{2} : KOH = 38 : 56$, 0.0374 grs. N_2O_3 are equal 0.0551 grs. KOH. These grs. alkali subtracted from the total alkali used per 1000 cc gives the amount equivalent to the nitric acid present in the solution, that is, 0.0762—0.0551=0.0211 grs KOH, which corresponds to 0.0143 grs N_3O_2.

No. 2 solution contains 0.0095 grs. N_2O_3 in 250 cc.

All three amounts of nitrous acid added, we get—0.0143 titrated as nitric acid, + 0.0374 +0.0095 = 0.0612 grs. N_2O_3 developed from 5 grs. of sulphite, which is 0.1224 grs. per 10 grs. pulp.

In the little table above, it can be seen that the three methods did not give equivalent results at all; upon further investigation it was found that the chlorine method differed considerably when repeated with the same material, while the iodine absorption depended not only on the percentage of lignin present, but also on the quality of the fibre material. For instance, a well-cooked and what is called a soft sulphite, showing to contain very little lignin with qualitative tests, absorbed a great amount of iodine, while samples of pulp which were called strong stock, and which contained large amounts of hardly cooked wood, gave a lower iodine figure. Considering that soft boiled pulp most likely contains larger quantities of oxy-, hydro- and hydrat cellulose for which the discriminating quality of iodine solution is often used, the negative results obtained with that reagent in the case of the lignin testing, can be understood. From the three methods there remained only the one Hempel and Seidel had proposed and it was now the question, whether it would always give the right values or not. Up to that time, only sulphite with comparatively little difference in lignin had been tested and repeated experiments gave the same results. Now, the author used a pulp containing very many impurities, and upon repetition the amounts of lignin found differed more than was permissible. Upon a close investigation it was found that with much lignin the reaction of nitric acid on the impurities became so strong at a certain temperature (70°) that some fog was formed, carrying nitric acid from the generating bottle to the absorption apparatus. With varying gas velocities this amount of mechanically transported nitric acid changed and therefore influenced the respective determinations differently. At the same time it was also found to be inconvenient to use washbottles as generators, because the heavy glass cracked, after making a few tests. The author therefore decided to use distilling flasks with a long neck and having proved that the nitric acid fog referred to above could not be filtered off entirely by means of glass wool or asbestos, a cooler was inserted into the flask extending over the whole length of the neck. This cooler carried a small tube as air inlet inside of it, the latter reaching down to the bottom of the flask. The air tight connection between flask and cooler was made by means of a small piece of rubber.

With this improved apparatus, uniform results were obtained in all cases. A few determinations of this kind may be given:—

Sulphite XX	grs. N_2O_3
7	0.1808
	0.1788
8	0.107
	0.108
9	0.169
	0.164
Wood 10	1.057
	1.050
11	1.361
12	1.335

Until now, all tests had been made with the material, as it came from the dry or wet machine; in other words, no consideration had been paid to some of the constituents of sulphite pulp, which, although present in small quantities only, could possibly have a greater influence on the results, than was anticipated. Of course, the moisture in the samples was tested simultaneously by drying a separate part of the same sheet. In order that the nitric acid might not be diluted too much, about air dry samples were always used.

Now the influence of the pitch was determined by using 0.100 grs. ether extract. It was mixed with small pieces of pure filter paper and tested as described for pulp. The total nitrous acid obtained was 0.024 grs. Considering that 10 grs. sulphite generally contains about 0.1 gr. ether pitch, besides some alcohol-pitch and a small amount of organical water extract, it was obvious that these contents should not be neglected, if exact figures as to percentage of lignin in pulp were desired. It was therefore necessary to extract, before determining the nitric acid figure, or as it turned out to be, the percentage of lignin. Results of some tests with the modified method, after extracting the sample with ether, alcohol and water, may be given:—

No.	grs. N_2O_3
13	0.0869
14	0.1052
15	0.0939
16	0.1097
17	0.0929
18	0.1343
19	0.0753

Having found that samples of sulphite contained up to 2 per cent. ash, the last seven results and all the following were figured on ash free substance.

It was now most interesting to try this new method with wood. A block of spruce about 12 inches in diam- which had been lying on a pile for several years, and which was absolutely sound, was split up and an average sample was taken, as well as possible. About 40 grs. of finest powder obtained by filing the wood was then carefully extracted with ether, alcohol and water. After drying the powder on a biscuit porcelain dish, different quantities were used for the lignin determination, as given below:—

	grs wood used per 100 cc nitric acid	grs. N_2O_3 per 10grs. subst.
1.	5.947	1.017
2.	5.544	1.034
3.	4.998	1.046
4.	4.356	1.053
5.	3.086	1.076
6.	2.537	1.067

It can be seen that the grs. N_2O_3 increase with the reduction of amount wood used, until it reaches a maximum at about 3 grs. wood. Obviously this mixture of 3grs. and 100 cc nitric acid, is the most favorable. In order to get the per cent. lignin, it was necessary now to determine which figure was equivalent to 1.076. Klason tested European spruce on cellulose and lignin, etc. and found the following results: 53 per cent. cellulose; other carbohydrates 13 per cent; lignin 28-29 per cent.; protein-substances 1 per cent.; pitch, oil, fat, ash, 4 per cent. Since, however, the wood contained so many substances besides lignin and cellulose, it was thought advisable not to use the figure of 28-29 per cent. for lignin, without having further proof that it was really equivalent to 1.076. Many experimentators have tried to solve this problem by testing the sulphite or other almost pure material on cellulose, pitch, ash, etc., and compare the difference from 100 per cent. thus obtained with their value for lignin. This way, although theoretically correct, should be used as little as possible, since the conclusions from a few per cent. lignin in pulp to large amount of it present in wood and other raw material, will change a small aberration from the ideal value into a big error.

When the wood could not be used as a raw material with a greater amount of lignin, because of its complex nature, it was necessary to look for something else. Of the many different fibre materials, only jute was available, according to the opinion of the author, since Cross and Bevan have proved in their researches on cellulose that jute contains nothing but cellulose and lignin, besides of course small amounts of pitch and ash. Therefore jute was extracted, and the lignin and cellulose contents determined.

grs nitrous acid	XX % lignin	% Cellulose	Chlo. t'tment lasts
0.7714		76.4	30 min.
0.7748		75.2	45 min.
Average 0.7731	20.1	75.7	25 min.
		77.7	25 min.
		80.9	20 min.

The per cents of cellulose were tested according to Cross and Bevan's method with chlorine. Originally Cross and Bevan proposed to make this determination in the following way:—2-5 grs. of raw material is well broken up and boiled with 1 per cent. caustic alkali solution. It is freed from liquid and subjected to the action of pure chlorine gas at ordinary temperature. The gas having acted on the impurities for some time, the latter depending on the nature of the substance, the excess of the gas is removed by a current of air and sulphurous acid. After removing the sulphurous acid, the material is boiled with a very weak solution of sodium sulphite. Having filtered off and washed, the alkali and chlorine treatment is repeated and the substance again boiled with sodium sulphite, until all lignin matter is removed, which can be judged by the color of the soda solution. The pure cellulose fibres are then collected, dried and weighed in some convenient way. Renker has worked with this and other methods to some extent, and he found that the boiling with alkali will dissolve some of the pure cellulose. He also recommends that the action of chlorine on the fibres is done at 0°C. According to him, the last operations are bleaching with 1 per cent. permanganate solution, removing the excess of the latter with aqueous sulphurous acid and finally washing with water. He filters and dries the precipitate in a Gooch crucible, inserted in a suitable weighing glass. Glass and crucible are put in a dessicator, which contains phosphorpentoxide as a drying medium, and which can be exhausted by a suction pump.

In regard to the action of weak alkali solution on fibre material, the author was able to affirm the objection of Renker, but in a few other points I could observe different qualities. Renker washes the cellulose with sulphurous acid solution after it has been bleached and further, he recommends drying the substance at a low temperature, because if it is done at 100°—110°C, the cellulose frequently becomes dark colored, by forming oxycellulose. Contrary to this, the author has found that pure fibres do not change their color upon heating to 110°C., if the use of the sulphurous acid was abandoned. The only necessity that arises from it is, that the isolated cellulose has to be bleached with another reagent, for instance, with very dilute sodium hpyochloride solution, fresh made, as the permanganate precipitates a manganoxide, which can not be dissolved, except with acid. It seems that the last traces of sulphurous acid cannot be removed by washing with water, either hot or cold, and that these traces, although infinitely small, are the cause of the discoloration that takes place, because sulphuric acid is formed. Bleaching with dilute sodium hypochloride solution left the cellulose white, even if heated for 1-4 hours. Only in places where the fibres touched the crucible wall, a little discoloration took place, owing to the greater heat there.

Then, too, it was found contrary to the observations of Renker, that the drying at ordinary temperature in the phosphorpentoxide dessicator was not complete in eight days, but took more time. It was therefore decided to heat the separated cellulose in a drying oven for about 4 hours first, and leave it in the dessicator then for about a day. The samples thus treated did not lose any more in weight when the operation was repeated.

As far as chemical reactions are concerned, the most influential factor of this method is the action of chlorine. This part of the work has to receive the greatest care, the more so, as different materials demand a different time for the reaction with chlorine. Every new kind of raw material has to be treated individually and in most cases the experimentator has to make not two, but six or more tests in order to obtain the right maximum amount of pure cellulose. Once the most favorable time for the chlorine reaction is found, it will give good results in all cases with the same material, although the physical state will also influence the result to some extent and has to be considered.

From these remarks, it will be understood that the cellulose tests for jute as given above differed considerably. Every sample of pure cellulose was then tested on lignin, ash and copper-figure. The first was done with phloroglucin solution qualitatively only. All samples were found free of lignin, with the exception, perhaps, of the last one, which had a slight yellow color, the latter possibly covering the lignin reaction. In any way, it could have been a very small amount only. The ash had to be tested, in order to be able to figure the percentage of pure fibrous material, and the copper figure was determined to show whether a possibly influential formation of oxycellulose had taken place or not. The copper figure of the above five samples of pure cellulose varied from 3.4 to 4.0, the highest figure being obtained with No. 2 sample. These copper figures seem reasonably low. In regard to the amount of cellulose, it can be claimed that 80.0 per cent will be the right quantity, since it is the maximum yield obtained with the chlorine method. Having found 0.7731 grs. N_2O_3 with the modified Hempel's method, it should be equal to 20.0 per cent. lignin. If we now figure from it the percentage of lignin with the results obtained with wood, we get 28 per cent. lignin for 1,076 grs. of nitrous acid, which is equal the amount of lignin Klason found in European spruce.

From the sulphite pulps referred to above, the percentages of lignin were figured now and at the same time the cellulose, which they contained, was isolated, acording to the modified method from Cross and Bevan. The results obtained were the following:—

No.	% lignin	%cellulose	total %
31.	2.2	97.4	99.6
32.	2.8	97.1	99.9
33.	2.5	97.3	99.8
34.	2.9	97.5	100.4
35.	2.4	97.2	99.6
36.	3.5	96.3	99.8
37.	2.0	97.8	99.8

All samples are figured on pitch and ash-free substance, and it can be seen that the results check well. Generally the total percentages are somewhat below 100, which is, however, only natural, as the cellulose test will give rather low figures. It need not be said that the resulting fibres were tested on lignin and oxycellulose, the former qualitative with phloroglucin and the latter quantitative acccording to Schwalbe.

Having thus found the adaptability of the modified Hempel's test, as a means of controlling the products of a sulphite mill it was desirable to make investigations on a larger scale, in order to obtain a fair knowledge of the different processes, principally of the cooking process.

There was, however, another field where the lignin test could be used with advantage, and a few examples of this kind may be given first.

At a certain paper mill it was found one day that the stock, consisting of about 55 per cent. ground wood and 45 per cent. sulphite was partly floating on the water, when flowing to the paper machine. A qualitative investigation with phloroglucin solution did not show very much. The floating stock gave a strong lignin reaction, but it was impossible to judge fairly well, how much ground wood was present. A quantitative analysis was made and gave the following results:— Etherpitch, 1.80 per cent.; alcoholpitch, 0.52 per cent.; water-extract, 0.43 per cent.; ash, 3.1 per cent.; lignin 0.2128 grs N_2O_3, which would be equal to 5.5 per cent.

It was obvious from the percentage of lignin present, that only a small part consisted of ground wood, while most of the substance was sulphite. According to other experiments in a pure state, the latter contained 3.0 per cent. lignin.

Further experiments in this case showed that the fibres of the chemical pulp were covered with traces of a fatty substance, which made them partly inactive against water.

2. From a certain paper, it was claimed that it contained 50 per cent. ground wood, and the writer was asked to determine the contents. An investigation gave the results below:—Etherpitch, 1.05 per cent.; alcoholpitch, 0.35 per cent.; water extract, 0.22 per cent.; ash 12.2 per cent.; the lignin figure was 0.6994 grs N_2O_3 per 10 grs. of ash free substance. When it was not sure whether all the rosin used for sizing and partially combined with alum could be extracted with ether and alcohol, separate tests were made. According to Herzberg, 5 grs. paper were boiled with 5 per cent. caustic alkali solution, filtered, washed and the rosin precipitated from the solution with dilute sulphuric acid. From the latter it was separated with ether. The size determination gave 1.3 per cent. ether and alcohol extraction had given 1.4 per cent.

Supposing that sulphite was used which contained about 4 per cent. lignin, which is most probable, it can be figured, from the amount of nitrous acid found above, that 40.8 per cent. of it was used, while 59.2 per cent. ground wood was mixed in. Considering 12.2 per cent. ash and mineral filler, besides the amount of size and alum, the final results are:—

1.4 per cent. size, 0.22 per cent. water extract, 1.0 per cent. ash, 11.2 per cent. loading material, 35.2 per cent. sulphite, 51.0 per cent. ground wood, while according to the papermaker, 50 per cent. ground wood was put in.

3. Other papers tested with this method gave the following results:—

Etherpitch, 1.66, 0.84; alcoholpitch, 0.74, 0.86; water extract, 0.18, 0.19; ash, 1.0, 1.0; loading material, 9.8, 13.0; sulphite, 30.1, 30.2; groundwood, 56.5, 54.0.

The ash in above samples is taken as 1.0 per cent. Of course either sulphite or ground wood may contain more of it, yet generally 1.0 per cent. will come very near the true figure. From a great number of ash tests with sulphite, the author found 0.7 per cent. as being a good average, while experiments with wood gave about 0.6 per cent.

Our present methods to determine the contents of ground wood and sulphite in paper are principally qualitative ,or rather founded on color reactions and comparisons with standard paper samples, and they are often deceiving. Herzberg states that the phloroglucin method might give an error up to 10 per cent. regarding the contents on ground wood. At the same time, it is true, of course, that with the above method errors can also be made, as it is not always known which kind of sulphite and wood has been used. Especially the former allows wide ranges in this respect. For instance, the writer had the opportunity to dedetermine 2 per cent. lignin in some samples, while others had up to 10 per cent. impurities. No doubt, however, these were exceptions, and particularly the second kind could be recognized very easily. Any sulphite with more than 6 per cent. lignin has distinctive features under the microscope if colored with phloroglucin or other dyestuffs. Therefore, if a microscopical examination is made previous to the other tests, the chemist can easily judge about what per cent. of lignin is present in chemical pulp.

With regard to the ground wood, it might seem that a still greater variety exists. The extraction with ether, alcohol, and water, however, removes several substances which otherwise would have influenced the result to a great extent. More frequent, and therefore of more general value, are investigations of the cooking process in chemical pulp mills, and especially determinations of qualities of the resulting fibres. A few examples will illustrate it.

At a certain pulp mill in the United States the author had the opportunity to test several digesters continually during a week, and in addition, he examined every product according to the scheme explained above, which had proved its reliability in former experiments.

The results of twelve tests were:—

Digester No.	Total %	Acid Free	Combined	Hrs. Cooking	% Ether Pitch	% Alcohol pitch	% Water extract.	% Ash	% Lignin	% Cellulose
1	4.80	3.42	1.38	8	0.83	0.24	0.34	0.64	5.6	92.35
2	4.70	3.32	1.38	7	0.97	0.12	0.20	0.61	7.3	90.80
3	4.73	3.35	1.38	8	0.99	0.10	0.24	0.61	4.0	94.60
4	4.64	3.29	1.35	8½	0.92	0.24	0.25	0.61	3.2	94.78
5	4.51	3.20	1.31	8	0.88	0.20	0.28	0.66	6.2	91.78
6	4.60	3.35	1.25	7	0.50	0.44	0.21	0.60	5.7	92.35
7	4.57	3.20	1.37	9	0.70	0.29	0.19	0.58	3.6	94.51
8	4.73	3.39	1.34	8½	0.81	0.28	0.19	0.58	3.8	94.32
9	4.64	3.29	1.35	8½	0.64	0.27	0.26	0.66	5.6	92.57
10	4.73	3.35	1.38	8½	0.88	0.29	0.27	0.51	3.1	94.95
11	4.51	3.20	1.31	8	0.82	0.16	0.37	0.61	4.2	93.82
12	4.70	3.32	1.38	9	0.84	0.09	0.30	0.59	3.4	94.75

If we compare the figures for the total, free or combined acid, with the percentage of lignin present in the resulting pulp, we find that no connection between these two can be constructed whatever. In one case, No. 2 Dig., the acid and lignin is rather high, while in the other, No. 7 Dig., acid and impurities are low, and vice-versa.

The time of cooking does not seem to have any influence on the results, either.

There is relatively little change in pitch, water extract, and ash, while the lignin varies rather much. Small differences of 1 per cent. and the like, are more important in this respect, because they denote a greater change of the cooking conditions. Furthermore, if, for instance, the well-kept average contents on lignin are 4 per cent., the yield per digester will be a certain one, while with the 5 per cent. impurities the output will be relatively far higher than is represented by the difference of 1 per cent.

The proprietor of the local paper at Eberswalde, a small Prussian town not far from Berlin, does his best to make his paper useful as well as instructive. Two days a week he has the General Anzeiger printed on only one side of the paper so that it can be used for wrapping up provisions without any danger of contamination from printers' ink. On these days the paper is twice as large as on ordinary days, so that the public loses nothing in the way of reading matter.

VIBRATIONS AND THEIR EFFECT ON OUTPUT

A Study of Speed in the Manufacture of Paper

By **JOHN W. BRASSINGTON.**

(Specially Written for Pulp and Paper Magazine).

INTRODUCTION.

The two main causes of deleterious vibrations in fast moving machinery are:

(1) The tuning of vibrations due to the intermittent torque of the driving shaft, with its period of natural vibration, together with lack of running balance of the driven mechanisms;

(2) Lack of rigidity of steel frame work of building containing the machinery, and consequent transmissions of vibrations due to reciprocating mechanisms.

When the speed of any machine is increased beyond a certain critical point, its component parts are thereby brought under the influence of laws governing vibrations; of laws governing the time of operation, that are not to be reckoned with at the slower speeds which characterized the machines that were considered speedy by the generation that is now passing.

It is always necessary in designing the drive of a paper machine to see to it that it shall be as nearly free from vibration when in operation as it is possible to obtain such an ideal condition. The influence of the drive on the quantity of output of the machine is a factor in its efficiency which is quite likely to escape the observation of any but those who have been educated by hard knocks to the fact that the tenuous, fragile thread of paper is as often broken by the drive as it is by any other cause, when the building is sensitive enough to transmit vibratory influences. Even when the designer has carefully arranged for the necessary stiffness of the foundations upon which the several parts of the drive are to be situated; that is, when the floor beams and columns on the driving side are chosen for stiffness and vibratory resistive qualities, as well as mere strength; when the foundations of the building itself are strong and not subject to vibration by passing trains, etc.; when the shafting is amply large and stiff, and the prime mover of sufficient power, there still remains lurking for mischief, the diabolic vibrations that maintain when the speed of the machine is high enough to make the period of variation in the torque nearly the same as the period of natural vibration of the driving shaft.

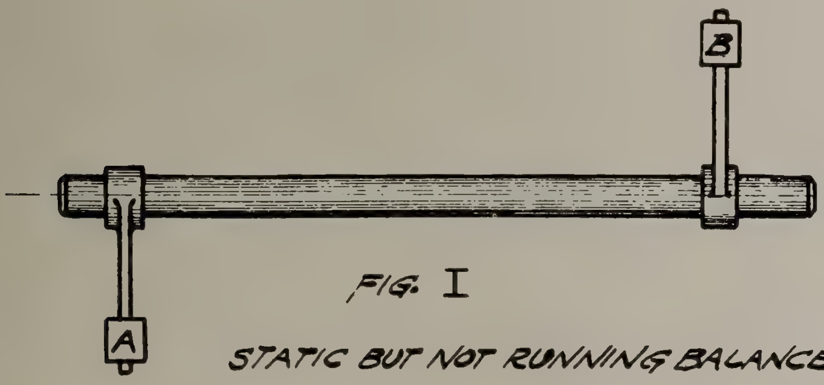


FIG. I

STATIC BUT NOT RUNNING BALANCE

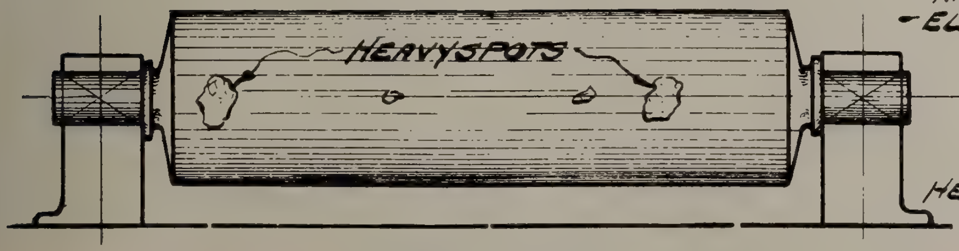


FIG. II

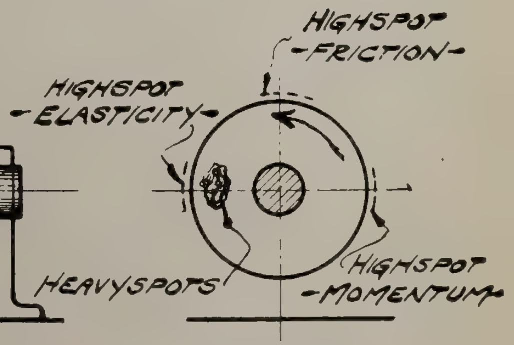


FIG. III

ROLL BALANCE DIAGRAMS

When a shaft is transmitting a uniform torque, or twisting movement, there is a uniform or steady twist in the shaft; say, for instance, in the variable speed driving shaft. This twist is directly proportional to the transmitted torque, and if the torque varies regularly the twist also varies regularly. If the period of variation of the torque is nearly the same as the period of the natural vibration of the shaft, the amplitude of the vibrations may be very great. Every driving torque, however constant, must have its periodic variation of intensity due both to the design of the reciprocating mechanism of the driver and to the inevitable lack of absolute balance in the driven parts. Fortunately, the fact that there is a large number of parts in a paper machine causes a tendency to intercorrection amongst the component parts of it, as a palliative of inherent tendency to vibratory variation of torque. The great superiority of one machine over another is often largely a question of balance; the better the balance, the more constant the output.

Now, as machines are run at higher speeds, the superiority of the better balanced machine is the more marked, yet the mere fact that some machines can be run faster brings into being the danger of failure, due to incremental vibration, caused by the machine itself tuning with the natural vibration of the shafting chosen.

It is interesting to measure the actual amplitude of vibration in a running shaft, and an instrument for this purpose has been designed by Mr. Frahm, of Hamburg. The principle of this instrument is that if a shaft is not rotated uniformly, the distances between successive marks, made on a coupling at equal intervals of time, will not be equal. By taking into account the amplitude of twist known by experience, for any given class of work, such as for instance the drive of a paper machine, the diameter of shaft can be selected, so that the natural harmonic vibration of the selected shaft will not be in tune with the amplitude of vibration induced by the particular class of work involved, for should such prove to be the case, it is more than likely that the twin vibrations will become rythmically incremental to each other, and actually manifest themselves in so marked a fashion as to set up injurious vibratory motions, not only in the machine being driven by it, but in the building itself. Such vibration means an increase in the order for broke for the beaters.

The problem of balancing the rotating parts of high speed machinery is most interesting and complicated. Because a body is in perfect standing balance, it by no means follows that it is anywhere near in running balance. Fig. 1 shows a shaft with weights A and B that may be in static balance, yet if this shaft is revolved at high speed, the centrifugal force generated by the two weights A and B will evolve a very noticeable vibration of the shaft. Such a case is, of course, easy to correct because we know at a glance where the unbalanced weights are, and also their radial distance from the centre line of the shaft. Figs 2 and 3 show in diagrammatic form the type of roll whose name is legion on a paper machine, and such rolls, be they ever so carefully made, are never even in perfect static balance, far less are they in perfect running balance, when they first arrive in the balance department. The difficulty of the problem of balancing such a roll is that it is not possible to detect the location of the heavy parts when the roll is at rest, even when the journals are resting on knife edges, and the roll is free to turn. Theory helped the practical man to solve this problem because it is a proven theorem that any unbalanced system of rotating bodies mounted on a stiff shaft can be balanced by two weights located at proper radii, in two planes perpendicular to the shaft; of the eight factors involved, i.e., location of the two planes, amount of the two weights, angular locations of the weights and their radii, any four may be assigned at the start, and the other corresponding four obtained. The first step is to determine the high side of the rotating roll; that is done by bringing up the body to full speed and marking the high points with a selected pencil. When the roll is again brought to rest the high spots are carefully marked at the centre, or it may be more convenient to mark the centre of the unmarked or low side.

At first glance it would appear that the high spot would indicate directly the position of the heavy spot, and that the balancing weight should be placed directly opposite. Generally speaking this is incorrect, as the high spot may occur anywhere around the circumference. The three things that control the position of the high spot are—momentum, elasticity and friction of the parts in motion.

If the body rotates on an absolutely stiff shaft in bearings, that are unconstrained, and free to move without any friction, then momentum alone is under consideration; in such case the body tries to revolve on an axis through its centre of gravity. Under this condition the high spot will come directly opposite the heavy spot.

Now suppose the body rotated without momentum, on a very elastic light shaft in bearings of great rigidity; then the high spot would come directly over the heavy spot.

Again, let us suppose that the body is without momentum, that it rotates on a stiff shaft in bearings the motion of which is limited in all directions by friction. Then the high spot will come ninety degrees back of the heavy spot in a direction opposite to that of rotation. See Fig. III.

Every body in rotation is affected more or less by each of these three factors, and the location of the high spot will depend entirely on the relations between them. Since we do not know, we must experiment. When it is possible to reverse the direction of rotation, the problem of balancing is obviously simple by trial and error. When the reversal of rotation is not practicable, it is wise to apply weights of considerable size on each end in any position, making them heavy enough to outweigh the original heavy spots; by trying such weights in two or three positions, it is possible to locate the proper places for the balancing weights and comparatively simple to determine their amount afterwards. In a shop like that of a paper machine builder, the balancing of rolls is such an everyday matter that it is not considered worthy of notice.

It is, however, evident that a rational line of precedure is essential to economy in time. It is apparent that a rotating body in balance at one speed is also in balance at all speeds. The prevailing impression to the contrary is due to the fact that all balanced bodies have one or more critical speeds at which the vibration is violent, although above and below such speeds the vibrations are mild. These speeds are the speed of synchronizations treated of in the opening paragraphs of this article; the first and lowest of these speeds is the speed at which the vibrations of torque tune with the natural period of vibration of the supports, and so these two vibrations become incremental each to the other.

If the building containing a paper machine is of light construction, say only slightly stiffer in the design of its steel framing than the better class of warehouse, it will then act as a conductor of vibrations from all sorts of sources (such as pumps, engines, wind, moving of heavy trucks, etc.) to the paper machine, so perplexing and infuriating the machine tenders, who will under such circumstances, begin to believe that the machine itself is possessed by an evil spirit. This tendency of machine tenders and operators to endow the engine or machine they have under their charge with a personality of its own, is due apparently to their sub-conscious belief that environment is the chief influence in the formation of character. In comparing the rigidity of the structures in which machinery is to be placed, the writer has been tempted to believe that the designers have not always paid sufficient attention to insuring rigidity in the design of columns, and it is possibly a debatable question whether the cause of much of the troubles that have developed in steel structures is not often due to this lack of appreciation on the part of the original designers, as to the effect of vibrations on the particular type of construction they have in hand; it is possible that otherwise unexplainable troubles are sometimes due to the use of the usual column formula in figuring the strength of the struts. The Rankine-Gordon Formula, by which practically all of the column tables in our present day hand books are figured, is based on the ultimate strength and not on the elastic limit of the material in use in the columns under consideration, and so does not take care of excessive column deflections and vibrations, due to fast moving machinery.

Mr. Carl G. Barth published in the Journal of the Association of Engineering Societies, some years ago, an article which the writer was sufficiently interested in to transcribe in part; the note-book containing the transcription reads as follows:—

"It seems impossible to conceive a rational formula for the ultimate strength of an ideal column, for no reason can be assigned why an ideal, centrally located column, however long, should yield in any other way than a short one. Evidently, therefore, a rational column formula can only determine and fix a design of column so that the load will subject the column, if well made, to no undue stress, even though a load be applied a little out of the centre."

In Mr. Barth's formula, the permissible working stress is taken as a function of the elastic limit of the material in compression; then this is considered equivalent to allowing for an assumed eccentric displacement of the load. A factor of safety is also taken on Euler's load, for a column so long that the direct crushing tendency may be entirely neglected, as compared with the bending tendency.

Mr. Barth in this way obtains a formula similar in form, but radically different in nature, to the Rankine-Gordon formula. This type of column formula is to the best of the writer's knowledge, used by German engineers in preference to the Gordon-Rankine formula.

Should such a formula be used to determine the size of columns in mills containing machinery, there would very probably be less breakage of paper, yarn, cotton, or fragile product manufactured in such buildings. It were well to watch, lest the twin scourges of the present time, namely, the curse of commercialism and the rush of modern business, besmirch the fair escutcheon of the Profession of Engineering; the times are strenuous enough in any case to try men's souls, and it were well that we stand together and leave no precaution unheaded, for the forces we are handling are becoming stronger and swifter day by day. Dame Nature's laws are each one simple and accurate in application, yet there are so many permutations and combinations of them that he must indeed be of vast ability who can say truthfully that he has properly arranged for all contingencies in any engineering enterprise he may have undertaken.

DUST EXPLOSIONS

That the dust of a paper mill may be highly explosive is the lesson of a study of conditions made in consequence of an accident at the factory at Turcoing, France, of M. Jules Petit. The factory was for the making of tubes or spindles of paper for use in spinning and weaving mills. The sheets of paper had to be pared down at the edges before being pasted. The work was done by a machine, and the dust was removed and fell into a chamber designed to receive it. This chamber was regularly cleared out, the workmen using during the process protected lanterns burning colza oil. They were required not to smoke. One day when the chamber was being cleaned, an explosion occurred, killing two men. The task of making a scientific enquiry into the circumstances and causes was entrusted to M. Albert Bonn, of the municipal laboratories at Lille. The cases and causes of other explosions in connection with industrial mishaps of like character were studied, and it was shown that dust explosions had been recorded in connection with coal mines, sugar refineries, starch works, and flour mills. The enquiry brought to light also what may have been the first attempt to produce an engine whose power would come from an explosion within a cylinder, now familiar in the world at large. As long ago as 1824 the experiments of one M. Niepce were described. He devised what he called a pyreolophore, which furnished motive power by a series of explosions in a cylinder provided with a piston, the material used being a mixture of organic dust finely divided. The case of the Minneapolis flour mill explosion and fire was also brought into evidence. Therein it was held that the presence in the air of organic matter extremely fine (corn pollen) formed an explosive mixture similar to that of ether or alcohol mixed with air. In another case at Corbeil, France, men engaged in clearing out the dust chamber of a flour mill saw sparks fly out of a lantern fixed on the wall and run along the walls. Then came the explosion. This was suggestive of what had caused the Turcoing accident. Experiments conducted under the auspices of the Comite Central des Houillieres de France indicated that the degree of inflammability of paper dust is practically the same as that of pure coal reduced by pounding into a dust passing through 200 mesh. Paper dust is extremely inflammable and may, mixed with air, give on contact with flame an explosion in a closed space. A blow of a shovel or brush might, under some circumstances, suffice to produce the condition of danger. Lanterns should not be used in dust chambers, or, by inference, in rooms in which dust is heavy. The explosion at Turcoing is thought to be the first of its kind. M. Petit, who was a sufferer by it, has published and distributed the report upon it for the benefit of others who may be concerned. His act should be appreciated. It will spread knowledge of a danger from modern industrial operations and so help those whose duty it is to provide for the safety of operatives and buildings alike.

WHO'S WHO IN THE CANADIAN PAPER INDUSTRY

Mr. C. Howard Smith, President, Howard Smith Paper Mills.

By W. A. CRAICK.

Howard Smith came by his inclination for manufacturing and selling paper quite naturally. In one respect it might almost be said that he was brought up on paper. His father was engaged in the useful occupation of news print consumption, using each week a considerable quantity of paper in the production of a prosperous country weekly. Young Howard from his earliest recollection was accustomed to move around in an atmosphere of type, ink and damp sheets, and by degrees grew to have a certain fondness for and skill in examining the quality and testing the printing capacity of paper stock.

For something like sixty-eight years the Smith family have been running the News at St. John's, Quebec, a record that has few parallels in the history of Canadian journalism. Founded by W. W. Smith, the grandfather of C. Howard Smith, the paper was managed for the past sixty-two years by his father, E. R. Smith, whose recent death was recorded in the daily press. A third generation is now in control of the publication in the person of Mr. Smith's brother.

Howard Smith began his mercantile career by entering the News office when he was fourteen years of age. A year later he ventured forth into the wide world and took a position in the warehouse of the Canada Paper Company, Montreal, where he soon absorbed a great deal of useful information about paper. In due course he was promoted to be city salesman of the company and for some years covered the metropolis with zeal and efficiency for his employers.

The next chapter in his career as a member of the paper trade was concerned with the ill-fated Montreal Paper Mills at Sorel. This enterprise, fathered by the Hon. Louis Tourville and his associates, was organized for the purpose of making paper out of the marsh grass that grew so luxuriantly around the shores of Lake St. Peter. The mill was erected and equipped and operations were commenced, but though immense quantities of the grass were obtained and brought to the mill in scows, when the stuff went into the boilers it dwindled away almost to nothing and the project was a failure. During the company's brief career, Mr. Smith was employed as salesman.

When the Montreal Paper Mills went out of business, their salesman decided that he would strike out for himself in the agency business. He had little or no capital but he possessed a good deal of nerve, and, putting on a brave front, opened an office in Montreal. He put up an attractive proposition to a number of mills and was duly constituted their selling agent. His genial manner and his willingness to oblige his customers gained him many friends and he prospered almost from the start. In a short time it became necessary to branch out into the wholesale paper business and he secured a warehouse for the purpose. From that date until the present time he has taken rank as one of the largest and most successful wholesale paper men in Canada.

As a sort of digression, about nine years ago, Mr. Smith was persuaded to take an interest in the Kinleith Paper Company at St. Catharines. He moved from Montreal to Toronto and lived for a couple of years in the Queen City, where he acted as sales manager for the Company, also holding a seat on the directorate. This work did not involve any change in his Montreal business, which went on as before. At the expiration of the two years he disposed of his interest in the Ontario Company and returned to his old home in Montreal.

Soon after Mr. Smith had got back to his former haunts, he organized a joint stock company to take over his wholesale paper business and then, as the turnover grew and opportunities for further development presented themselves, he decided on putting into effect a scheme which he had been revolving in his mind for some time. This was the erection of a paper mill to manufacture a line of high grade papers. For this purpose his company was enlarged and fresh capital secured.

The Howard Smith Paper Mill, which was erected during the winter of 1912-13 at Beauharnois, twenty-two miles south of Montreal, is justly regarded by Mr. Smith as a model of excellence in construction. To its designing and erection he devoted himself unsparingly. In his own words, he lived with the project, and the result of his efforts is today one of the finest, if not the very finest, mills of its kind in America. Construction was begun in the fall of 1912 and on May 31st, 1913, the first paper was turned out, constituting pretty nearly a record in the building of paper mills.

Designed to accommodate two machines, the Howard Smith Paper Mill, which, by the way, is the second loft-dried mill in Canada, contains an 84-inch Fourdrinier machine, six 800-lb beating engines, ten 1,000-lb washing engines, one Jordan engine and one rotary bleach boiler. So far the project has enjoyed uniform success and the product of the mill has been quite up to expectations. A second paper machine will, it is said, be installed in the near future.

The man to whom credit must be given for the completion of this fine new mill is personally the acme of neatness and good taste in dress. Probably among the paper manufacturers of Canada he would be regarded as the Beau Brummel, the one whose sartorial appearance was always correct and up to date. He is most genial in manner, a good mixer, and is popular among his associates. In his business relations he is looked upon as straightforward, capable, and reliable.

"I have done nearly everything a fellow could do and live, except go in for politics," declares Mr. Smith, when asked regarding his favorite pursuits. "Lately my mill has been the one absorbing hobby of my life. Before that I used to get in some golf at the Royal Montreal Golf Club links at Dixie and I have always been fond of horseback riding. In my younger days I had a taste for military affairs and attended the military school at St. John's, afterwards holding a commission in the old 6th Fusiliers, now the 1st Prince of Wales Fusiliers, but I gave that up years ago. I am interested in early Canadian history and have got together quite a large collection of books, but I regret that I have so little time to devote to reading."

In the formation of the Canadian Pulp and Paper Association Mr. Smith took an active interest and did good work in forwarding the organization. He was made chairman of the writing paper section, a post which he occupies with acceptability.

Ottawa Notes

Ottawa, Ont., June 10. — Lumbermen and paper manufacturers in the Ottawa and Gatineau Valleys are greatly concerned over the scarcity of water in streams throughout this district as well as in the Ottawa River itself. For some time a record lowness of level has been noticeable, and instead of improving, conditions seem to be getting only worse. A number of firms who operate along various tributaries of the Ottawa have already been obliged to close down, while Gilmour and Hughson, an Ottawa lumber firm, with mills on the Gatineau, state they will have to follow suit unless conditions improve. Not only will this mean delay in getting pulp wood to the local mills, but it will mean greatly reduced power for the mills at the Chaudiere Falls on the Ottawa River. Millowners are now preparing to face a power shortage during mid-summer.

Changes of considerable importance to the pulp and paper trade are proposed to be made in the Railway Act, which has been under consideration by a joint committee of the Commons and Senate during the past session, and will be taken up again next session. Lumbermen and paper manufacturers will unite in asking for some changes in the Act, it is learned, while they are also united in opposing one change proposed by the Government.

This is the proposition to place inland water traffic rates under the control of the Railway Commission, which now regulates railway rates. From what your correspondent can learn the proposal will probably mean better rates for the small shipper but considerably higher ones for the large shipper of timber, pulp or paper. It was urged by shippers during the preliminary hearing that in the nature of things the Railway Board would have to fix uniform rates which would mean the elimination of the special rate a large shipper can at present obtain in consideration of the size of his shipments. As their American competitors would labor under no such disability, Canadian members of the trade urged before the committee and will again urge next session, that the proposed change would affect their ability to compete. Another objection is that it will put an end to competition among vessel carriers and consequently to competition with the railways in summer, which at present always brings down the rates of the latter.

Plans are being prepared for the erection of a new Government Printing Bureau. It will be much larger than the present structure, and will enable the Government to itself execute much work that is at present given to outside firms. The government's requirements both as to paper and printing are very large, running into millions every year. The present building is not only cramped, but is said to be unsafe, 600 tons of paper piled on an upper floor recently jeopardizing the existence of the structure.

Timber and pulpwood worth many thousands was involved in a case in which judgment was given in the Exchequer Court at Ottawa last week, that of the King vs. the Vancouver Lumber Company. Justice Cassels gave judgment upholding the contention of the City of Vancouver and the Dominion Government that the company's lease of the Deadman's Island, Vancouver Harbor, and the timber thereon held good only for a term of years, and was oot a perpetual lease.

The case hinged on a deed executed in 1900 by Sir Frederick Borden, former Minister of Militia and Defence, which waived certain conditions of the lease given to the company by the Government in 1899. The judgment decided that the lease was invalid inasmuch as it had been made without authority. The matter has been in litigation for years .

The spread of the co-operative idea in forest fire protection is evidenced by the recent organization of the Lower Ottawa Forest Protective Association, Ltd. The Association now includes all the paper manufacturers of the Ottawa and Gatineau districts and represents over 6,250,000 acres of timber lands on the watersheds of the Gatineau, Lievre, Rouge, Coulonge, and Nation Rivers. The staff will comprise a manager, three inspectors and fifty rangers. The headquarters of the Association will be in Ottawa. The manager of the Association, with a view to rendering his work more effective, has been placed on the staff of the Forest Protection Branch of Quebec as well as of the Fire Inspection Department of the Dominion Railway Commission. It is also proposed to promote close co-operation with the settlers and the railways in the territory covered.

In pursuance of his recently announced policy of conserving waterpowers for the people, Hon. Dr. Roche, Minister of the Interior, has reserved all the available Dominion lands near the Grand Rapids on the River Saskatchewan until a report has determined what lands are required for power development at these rapids. The country in their vicinity is well covered with good pulp wood, and it is thought that if the river can be made to give a uniform flow power might be developed to utilize this natural resource.

MAC.

BACK NUMBERS OF THE PULP AND PAPER MAGAZINE WANTED

The publishers are anxious to secure copies of the March 15, April 1, April 15, July 1 and July 15 issues of the Pulp and Paper Magazine.

Decision in Russian Pulp Wood Case

✓ (Special to Pulp and Paper Magazine.)

Washington, D.C., June 10, 1914.

The decision of the United States Court of Customs Appeals in the case of wood pulp manufactured in Germany from pulp wood cut in Russia, which was handed down on June 1st, is of keen interest to paper manufacturers of this country. The case in question (No. 1371) was a consignment of 125 bales of bleached chemical wood pulp. Though the shipment came from Germany, and the pulp was made in that country, it was proven that the pulp wood was grown in Russia. Therefore it was the question of duty that caused the case to be taken to the Court of Customs Appeals. The shipment was assessed duty by the Collector at New York. The importers protested, and the Board of United States General Appraisers sustained the protest. The matter was taken to the Court of Customs Appeals, which court also sustained the Board of Appraisers. Judge Baron, in rendering his opinion said in part:—

"The collector of the port of New York assessed duty upon this pulp presumably under the provisions of Paragraph 406 of the Tariff Act of 1909. The importers protested, claiming free entry under the provisions of Section 2 of the Act of July 26, 1911, entitled, "An Act to promote reciprocal trade relations with the Dominion of Canada, and for other purposes," and the provisions of what are commonly called the "most favored nation cases" in treaties subsisting between Prussia and other German states now composing the German Empire. The Board of General Appraisers stipulations made:—

As no witnesses appeared before the Board, the case was heard upon the papers, and the following stipulations:

"It is hereby stipulated and agreed by and between the parties hereto that the wood pulp, the subject of the protest above named, was manufactured in Germany from pulp wood grown and cut in Germany and Russia, but not in Finland, and exported directly to the United States from Germany and that neither the wood pulp nor pulp wood were subject to any export duty, export license fee, or other export charge of any kind whatsoever (whether in the form of additional charge or license fee, or otherwise) or any prohibition or restriction in any way of the exportation (whether by law, order, regulation, contractual relation, or otherwise), directly or indirectly."

Should duty be asesssed on wood pulp manufactured in Germany from pulp wood cut in Russia, was the real question which had to be decided by the Court. It appeared that neither the wood pulp nor the pulp wood were subject to any export tax or restrictions whatsoever. This involved the consideration of the Court of Section 2 of the Canadian Reciprocity Act of July 26th, 1911, which reads as follows:—

"Sec. 2.—Pulp of wood mechanically ground; pulp of wood, chemical, bleached, or unbleached; newsprint paper, and other paper, and paper board, manufactured from mechanical wood pulp or from chemical wood pulp, or of which such pulp is the component material of chief value, colored in the pulp, or not colored, and valued at not more than four cents per pound, not including printed or decorated wall paper, being the products of Canada, when imported therefrom directly into the United States, shall be admitted free of duty, on the condition precedent that no export duty, export license fee, or other export charge of any kind whatsoever (whether in the form of additional charge or license fee or otherwise), or any prohibition or restriction in any way of the exportation (whether by law, order, regulation, contractual relation, or otherwise, directly or indirectly), shall have been imposed upon such paper, board, or wood pulp or the wood pulp used in the manufacture of such paper or board."

Regarding this section of the Canadian Reciprocity Act, the Court said:—

"It is agreed that, if under this section wood pulp manufactured in Canada from pulp wood cut elsewhere would be entitled to free entry, assuming the conditions and tariff status of said wood pulp and wood to be correspondingly identical with the status and condition of the wood pulp and wood in this case, it follows that the wood pulp here is entitled to free entry, otherwise it is not.

"An examination of Section 2 results in a further reduction of the issue to this single question, Does the term 'being the products of Canada'' employed therein require that the pulp wood from which the wood pulp is manufactured must be cut in Canada, must be the growth of its soil."

"The Government strenuously contends for an affirmative and the importers with equal vigor for a negative answer to this question."

Before affirming the decision of the Board of General Appraisers the Court mentioned many cases that have been decided by the Courts, after which Judge Barber said:—

"We proceed to a more careful consideration of said Section 2 to ascertain if possible whether Congress used the expression 'being the products of Canada' in a restricted sense as referring to products made from raw material of Canadian growth and claimed by the government, for, if so, the wood pulp manufactured from pulp wood cut in Russia is dutiable, and this examination is extended to other sections of the Act of which 2 is a part.

"The opening paragraph of Section 1 of the Act declares the duties therein mentioned shall be levied and collected upon articles that are the 'growth, product, or manufacture' of Canada, and this language is several times repeated in the Act." Continuing, the decision says:—

"The word 'growth,' of course limits the merchandise which it may describe to the product of the soil, and if Congress had intended that this limitation should attach to the merchandise which was the subject of Section 2, it would naturally be expected, in view of its previous care in selecting language to express its will, that Congress would have employed in said Section some such term as 'being manufactured from wood grown in Canada.' No language of that express import, however, is to be found therein. The word used is 'products,' and these products are, in fact, manufactured articles. If, as was held in Balfour vs. Sullivan, supra, grain bags made here of foreign material were the manufacture of the United States, clearly wood pulp made in Canada from foreign material must be the manufacture of Canada.

"Nor, considered without regard to other portions of the Act, do we find in Section 2 any satisfactory indication that the merchandise therein given free entry is required to be a product of the soil of Canada. The merchandise iself is certain wood pulp paper, and paper board. To such thereof as is within the condition precedent in all respects free entry is given.

"This condition precedent is attached to materials only, and not to their place of origin, and the condition is that such materials shall be possessed of the free unrestricted right of export. Acid is used in the manufacture of chemical wood pulp; sizing enters into the manufacture of paper; and yet it can hardly be supposed that Congress intended these articles when employed introducing the merchandise named must also be made from raw materials whose origin was Canada. No language of the section expressly declares that the raw material must be of Canadian origin, and, unless it be so required, the pulp wood from which the wood pulp in this case was made possesses all the attributes required by the condition precedent.

"Neither do we find in the purposes to be accomplished by the section any sufficient indications of an intention to limit the meaning of the word 'products,' as claimed by the Government. Manifestly one purpose was to promote the free export of pulp wood to this country. It was also desired to encourage and promote the export to this country of the named manufactured products of pulp wood. The consumers of wood pulp, paper, and paper board were equally benefited by its free entry here whether wood from which it was produced came from Canada or some other country. Congress provided as the declared condition of such free entries that the wood from which it was made must be entitled to free and unrestricted export without declaring that the country of manufacture must also be the country of origin of the raw material, and we see no reason to read into the statutes anything beyond what we consider its plain meaning in this regard.

"In the argument it is contended by the Government that in the case of Cliff Paper Company vs. United States, supra, we have impliedly decided the issue here against the importers' contention. It is sufficient to say that the question here raised was not before us in that case, was not considered, and was not decided.

"The judgment of the Board of General Appraisers is affirmed."

A NEW MARKET FOR CANADIAN PULP

That Cuba offers a large and growing market for Canadian pulp and paper is the report of the Acting Trade Commissioner, A. T. Quiley, Havana. In 1912, of the total import of 337,378 tons of wood pulp and news paper (which are exempt from duty) Canada supplied only 39,005 tons. Says Mr. Quiley:

"With the large number of periodicals printed in Cuba, news paper, which enters free of duty, should be imported from Canada in larger proportion than what the statistics point out.

"There are one or two factories of paper bags in Cuba, but their output is far below the demand.

"Canada contributed in the year 1911 with 9,459 kilograms of wrapping paper out of a total of 362,566 kilograms imported by Cuba. The above figures are not in keeping with the possibilities enjoyed by Canadian manufacturers of this commodity.

"While Canada holds a certain portion of the Cuban trade, nevertheless she is far from occupying the position to which she is entitled in relation to other countries. An important drawback is found in the absence of adequate shipping facilities. With a fair steamship service and reasonable freight rates there is reason to believe that her commerce would develop to considerable proportions notwithstanding the United States preference, as the demand in Cuba for Canadian products is only withheld through lack of transport."

Felt Men Classify Rag Stock

(Special to Pulp and Paper Magazine).

New York, June 13, 1914.

As reported in the last issue of the PULP AND PAPER MAGAZINE, the Felt Manufacturers' Association and the Associated Dealers in Paper Mill Supplies had some difference regarding the classification of stock by the mills and the terms of rejection. The dealers appointed a committee to make satisfactory terms with the paper men. This body drafted several amendments, the spirit of which was to give the dealer some say in the rejection of stock.

The Felt Manufacturers' Association promptly took the matter in hand and adopted the recommendations of the dealers with some slight changes and also added a new class of rags to be known as "City Dump Rags," which will cover the stock which some dealers specialize in.

J. M. Richardson, president of the association, sent a letter to the chairman of the dealers' committee, which has been circularized among local shippers. A part of the letter is as follows:

"I think that you will now thoroughly realize that it is the desire of our association to work harmoniously with the dealers of our raw material that are anxious to co-operate with us. The sooner the packers of these bales are informed that the felt mills are determined to have these evils corrected, the better it is going to be for all concerned, and I, for one, am satisfied that within ninety days you will find that it is just as pleasant and profitable to sell roofing rags as any other commodity you handle. The men who do not take the mills seriously in this last move, which is to become effective on June 8, and also the men who offer resistance to this move, for honest dealing, are certainly going to regret it before many weeks go by, as they will surely find that the mills are determined to get results this time, and end their troubles once and for all, even though it is found necessary for some of the mills to shut down indefinitely for the want of raw material."

The new classification became effective June 8 and is now as follows:

Classification of Rag Stock.

Effective June 8, 1914.

No. 1.—Roofing Rags.

Soft rags containing a percentage of wool. Satinet garments, including men's coats, pants, vests, mixed linsies, seams, women's coats, sacks and cloth skirts, all containing a portion of wool fibre.

No. 2.—Roofing Rags.

Cotton rags. Large and small cotton rags, including linings (without seams attached), silk rags, rag carpets, print rags and stockings.

No. 3.—Gunny Bagging.

Free from fertilizer, charcoal, coal and cement sacks and chemical, lime and plaster bags.

No. 4.—Brussels and Hard Back Carpets.

No. 3.—Roofing Rags.

A.—Tailor rags, free from all rubbish and paper. B.—Tailor rags, to contain not more than 10 per cent. paper. C.—Tailor rags, to contain over 10 per cent. and not to exceed 50 per cent. paper.

No. 5.—Roofing Rags.

1. The following materials, when baled separately, can be used in the manufacture of felt, but should not be included in the above grades: Canvas, window shades, strings and buckram.

2. The above shall be free from paper (except No. 5 stock, B and C as above) and rubbish and any materials which are not suitable for the manufacture of felt paper.

3. Included in the materials not suited for the manufacture of felt paper are: Shoe cuttings, felt boots, hats, corsets, suspenders, oil cloth, matting, leather, rubber, rope, mackintosh clippings, pasted stock, wool, stones, metal of all kinds, tin cans, glass, bottles, ashes, bones, shoes, excelsior, etc.

4. We cannot agree to hold shipments of inferior grades indefinitely for adjustment, assorting or reshipment, as our warehouse facilities and unloading platforms are of such limited capacity that it is impossible to store defective stock sent us. When stock is rejected, the mill shall notify the shipper, and such rejected stock will be held at the expense and risk of the shipper only long enough to allow the shipper to inspect the stock before it is disposed of. We want only the grades ordered and of the classification stated herein.

5. Should stock shipped us, which appears to be of grade billed, later prove upon opening the packages to be of inferior grade, or containing moisture, we reserve the right to charge and collect the difference in value when the defect is discovered.

6.—Marks.—It is necessary that each shipment, and every package in every shipment, be tagged with a distinguishing mark, including weight and grade, in order that it may be positively identified at the mill. Such marks should be clearly noted on each invoice.

7.—Invoices.—Separate invoices, accompanied by bill of lading, should be rendered invariably for each consignment or carload, with notation of order number, marks, total number of packages, grade and total weight and car number, and list of weights of each grade.

8. Shippers of stock must assume all risk of loss or delays when invoices, bills of lading and marks are not sent as requested above.

All Material Subject to the Following Conditions.

9. Rags and all material purchased on this order are guaranteed by shipper to be dry and free from rubbish or any material not suitable for making paper or felt. Stock containing moisture, rubbish or any material not suitable for making paper or felt will be rejected. Class 6 containing moisture will be accepted, but bought and settled for on basis of actual dry weight.

10. Your acceptance of our order constitutes agreement to the above terms.

11. We reserve the right to adjust any irregularities against subsequent shipments.

New Honor for Pulp Man

Mr. L. M. Wood, who was associated with the original issue of the Spanish River Pulp and Paper Company, Limited, with his brother, Mr. John Wood, arranging the first re-organization of this company, is the newly-elected president of the Standard Chemical Iron and Lumber Company. He began his career with the Bank of Nova Scotia at Halifax, and after being associated with financial firms, was appointed manager Dominion Bond Company, Ltd., Toronto. Mr. Wood established the present business of J. & L. M. Wood, financial agents, Toronto, in 1911.

Activities in American Association

(Special to Pulp and Paper Magazine.)

New York, June 13th, 1914.

The American Paper and Pulp Association has shown some activity recently. A live enthusiasm for the maintenance of the parent body has been shown since the last meeting of the Association last month. A meeting of the Executive Council of the Association was held at the Association offices at 50 Church Street recently, and Frank L. Moore, president of the Newton Falls Paper Company of Watertown, N.Y., was elected president. No national secretary was elected, but those in attendance were very enthusiastic over the new plan of development.

The news division has also met to amend its by-laws to conform to the new organization of the parent body and to appoint a committee to select a secretary to look after its affairs.

The Executive Council will meet again in the near future to complete all details of reorganization. The new Executive Council will be composed of three members of each division. The association will maintain its offices in the Hudson Terminal Building for the present at least, and the present force of clerks will be retained until the next meeting of the Executive Council, when it is hoped the new secretary will be put in charge.

H. H. Bishop, who has had much experience as an association worker, has already assumed his duties as secretary of the wrapping division, and B. F. Naylor, who is secretary of the writing division, will take his offices to 50 Church Street about July 1.

Mr. Moore, the new President, is considered the biggest man in the paper industry, and has a chain of honors to his credit. He was Vice-president of the wrapping paper division for two years. His work as President of the Newton Falls Paper Company has been highly commended all over the country. He is also President of the Cylinder Paper Company, President of the Empire State Forest Products Association, President of the Watertown Chamber of Commerce, and a member of the Board of Safety. His wide circle of activities keeps him busy and although the latest honor conferred upon him was designed to be a purely honorary position, Mr. Moore will make it an active one.

Mr Moore's plan is to have representatives study the conditions of paper manufacturing in other countries and to make a constructive analysis of the attitude of foreign governments toward the paper industry. Another plan is to collect statistics regarding the cost of insurance and compensation rates in order to bring about a uniform rate of liability for paper manufacturers.

As the position of President is filled by Mr. Moore without compensation or expense to the Association, it is his earnest desire that the members will sincerely co-operate with him and make suggestions that they think will be helpful to the entire trade.

The wrapping division held a meeting at the Hotel Belmont on the following day. The main purpose of the meeting was the introduction of the new secretary, H. H. Bishop, who made a brief outline of his plan of work in collecting statistics that will be of more value than those used in the past. The division also listened to an address by Charles H. Case, an expert cost accountant of Cleveland, Ohio, on the subject of uniform costs. It is the purpose of the division to bring about a uniform system of costs for the manufacture of all grades of wrapping paper.

CLAY IN THE PURIFICATION OF MILL WASTES

In Europe, especially in Germany, great interest is being taken in the application of modern theories of colloidal chemistry to the purification of mill wastes. The colloidal properties of clays by which they are capable of absorbing liquids, and certain solid materials, to a greater extent than their own weight or volume, has been made the subject of special study by Prof. P. Rohland, of Stuttgart, who has applied his great knowledge of the subject to the correction of undesirable conditions connected with the disposal and utilization of the waste liquors of paper mills.

The remarkable property of absorption possessed by certain clays renders them capable of removing solid substances from solutions with which they may be in contact, and it is this property which Professor Rohland has utilized in the purification of mill wastes.

Professor Rohland discusses the colloidal clay purification process in recent contributions to the German technical press, notably in the Wochenblatt fur Papierfabrikation, 18 1914, and Zentralblatt fur die osterr.-ungar Papierindustrie, 4, 1914, and with a view to keeping readers of "Paper" fully advised regarding the progress of science in its relation to papermaking in all its branches we give herewith a translation of Professor Rohland's contribution to the Wochenblatt. He says:

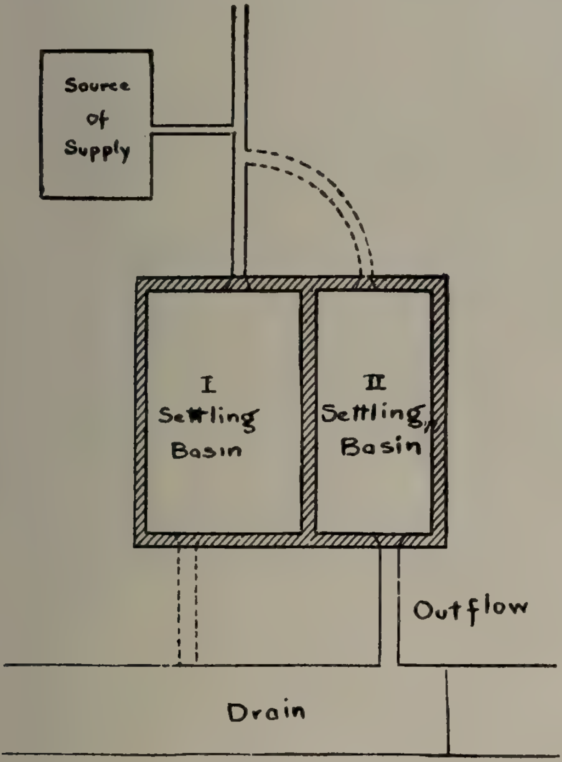


Fig. 1.

As a result of various inquiries, I propose in this paper to discuss somewhat more thoroughly my colloidal clay purification process.

The waste liquors from paper mills contain a considerable quantity of minute solid constituents proceeding from whole-stuff and vegetable fibres; their color is mostly yellowish, yellow to grayish-brown, some are odorless, others give off a decidedly evil odor; the waste liquor may be neutral or have a slightly acid or even an alkaline reaction. In consequence of the diversified composition of waste liquors of paper mills the colloidal clay purification process cannot always be employed in the same manner. In the preparation of the clay emulsion, useless components, all foreign matter such as sand, etc., must be readily removable from the colloidal clay, the volume of clay employed being considerably reduced in this way.

The chemical structure of colloidal clay is based on a widely varying composition, and the main factor is always to select the proper clay and also to determine the quantity to be added accurately and in the right manner. This applies as well to a possible supplementary addition.

Where suitable clay is used the waste liquor is first quickly clarified, the solid, minute particles being precipitated by the sinking clay. The purification of the waste liquor is effected by the absorptive property of the colloidal clay. This absorption is possible by the fact that the clay presents numerous boundary and separation surfaces to the fluid to be ~~absorbed, in~~ which superficial energy, superficial tension and capillarity are active. It is consequently a colloidal chemicophysical process that takes place.

To employ a rough simile, we can imagine the colloidal action of clay to resemble that of a sponge, which absorbs and retains water, but with the difference that the water can be again removed from the sponge by pressure, while the substances absorbed by the colloidal clay, for instance the coloring substances of complex constitution, cannot be washed out again.

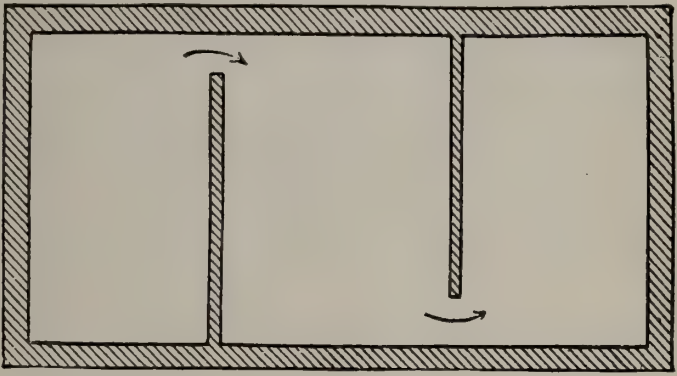


Fig. 2.

It can also be imagined that the colliodal clays act like semipermeable walls, the large molecules of the albuminoids, the carbohydrates, as well as the complex coloring substances, being retained by them, while the smaller molecules and the ions of salts, for example, are diffused freely and not retained.

This absorptive capacity of colloidal clay is effective on the following descriptions of substances:

1. On colloidal dissolved substances such as are contained largely in the waste liquors from paper mills, starch, dextrine, products of albumin, decomposition products, tannin, etc.

2. On coloring substances of complex constitution, as well as those that occur in nature, such as saffron and annato; also the artificial varieties, such as aniline dyestuffs, etc.

Coloring substances of animal origin, such as carmine, are also absorbed. The supposition is that these coloring substances are of complex constitution, the colloidal principle applying to substances of this kind.

The waste liquor from paper mills contains coloring substances that originate in the wood substance or the cellulose, and are consequently of vegetable character; when colored papers are made, aniline coloring substances are found, all of these dyes and tints being absorbed by the colloidal clay so as to render the waste liquor as clear as water.

Moreover, oils, machine oil, such as frequently float on the surface of the water and are noticeable by reason of their rainbowlike irridescence, are likewise absorbed by the clay.

Disagreeable odors are also removed. Some paper mill waste liquors have a slight, others a stronger, odor of sulphureted hydrogen. It is these odors which attract the attention of the factory inspectors and cause trouble.

Finally, the colloidal clay absorbs certain ions, as carbonate and bicarbonate ions, phosphate ions, the absorption being attended by an exchange of the alkalies in the solutions for the earth alkalies in the colloidal clay.

The colloidal clay mixed with the waste liquor is allowed to undergo sedimentation in the settling basins with the minute solid particles and the absorbed substances.

These sedimentation basins are not always properly constructed. It is often found that they are simply excavations in the earth, having only a uniform depth of one yard, so that no quiet precipitation can take place, and muddiness nearly always occurs. The depth of the basins at the influx of the waste water should be at least six feet, and three feet at their discharge, so that a sloping bottom may be obtained. To promote better sedimentation and facilitate cleansing, the sidewalls should also be of sloping construction. The progressive flow from one settling basin to another must not be planned sidewise, as shown in Fig. 2, since in this way the solid particles that should have been deposited in the first settling basin are carried further with the others. It is much better that the waste liquor should flow over the cross-walls of the settling basin, these being progressively lower—by about eight inches.

Fig. 1 shows a larger classifying and purifying plant according to the colloidal clay method. At the entering canal for the waste liquor, there is a hydraulic engine that adds the clay emulsion to the waste liquor. For more convenient cleansing there are provided alternative inflows for the waste liquor into the settling basin and for its discharge into the drainage.

The settling basins are best made from stamped concrete. If, however, the waste liquor is acid, it is advisable to line the inner walls with earthenware tiles.

The colloidal clay purification process is cheap, much cheaper than processes operating with artificially made preparations. If settling basins are available, all that is necessary for the operation of the clay refining plant is the installation of a simple hydraulic engine.

In concluding his paper Professor Rohland called attention to the fact that a new water law became effective in Prussia on April 1, 1914. Section 24 of this law makes the person who causes excessive contamination of drainage waters, by the discharge into them of waste liquors, responsible for the resultant damages, and may be made the means of harassing manufacturers, through malicious neighbors making complaints to the authorities until they are compelled to interfere.
—Paper.

POINTS WORTH KNOWING.

(Continued from issue of June 1st.)

19. Burning out oil spots from the wire must be absolutely condemned, because the wires are attacked at the soiled parts or are lengthened unequally, which causes the formation of bulges. The mode of cleaning will depend on the kind of the spots. In the case of heavily sized papers alcohol or bisulphide of carbon will be used, and for oil and grease spots alkalies, benzine or turpentine. For spots due to loading materials dilute sulphuric acid should be employed.

20. As a covering for flat suction-boxes, leather should be employed for tissue papers, hard wood for medium fine and medium heavy papers and ebonite for board.

21. Peat can be very well employed for certain kinds of building felt. An admixture of 30—50 per cent. peat to second quality chemical pulp and brown mechanical wood pulp imparts to the product specific lightness and the property of absorbing moisture.

22. Sizing can be improved not only by increasing the admixture of size milk and sulphate of alumina; adding sulphate of alumina in the edge-runners or the kneader and employing size having a high percentage of free rosin enable the quantity of size added to be reduced by about one-half.

23. By means of the Oechelhauser machine M. G. paper can be obtained of a breaking-length greater than that obtained with the ordinary Fourdrinier machine. This has been determined by parallel tests with the same composition of pulp and kind of beating and other like conditions.

24. Without doubt the cylinder mould is best suited for yarn papers. As great a breaking-length as possible in the longitudinal direction, which comes almost solely into consideration, can be most readily obtained.

25. Rejected printing paper is best treated for being used again in a funnel-like vessel with alkalies, whereupon the almost pure pulp is run off below, whilst the soiled parts are removed from the surface.

26. In order to increase the life of leather belts it is not sufficient to grease occasionally. In order to make the pores of the leather able to absorb the grease the belts should be thoroughly washed with a weak alkaline solution and after drying be treated with a good grease free from acid.

CLEAN PULP FROM OLD PAPER.

Acording to the opinion of a writer in the Wochenblatt fur Papierfabrikation, the washing of printed and written paper, or the conversion of old paper into new, has long engaged the attention of inventors. Increased interest has been aroused in the subject by the impending scarcity of wood. Professor Kirchner's estimate shows that out of two million tons aggregate production of paper, 200,000 tons (or 10 per cent.) represents old paper worked over again. Apart from paper recovered from the household newspapers and account books form a large proportion. The process as carried out at Reutlingen, Germany, is fully described. The article concludes as follows:—

"With paper washing there opens a new era for the waste paper business and a source of national wealth. Even the spectre of a wood famine appears less threatening. So from overnight paper washing has grown from a much ridiculed problem to a branch of paper manufacture. He who has eyes to see, let him see."
—Paper Trade Journal.

SUITABILITY OF LONGLEAF PINE FOR PAPER PULP

Bulletin by HENRY E. SURFACE, Chemical Engineer in Forest Products, and ROBERT E. COOPER, Chemist in Forest Products.

Southern Pines for Kraft Pulp.

The southern pines have not, until within the last few years, been considered suitable for paper pulp. Their resinous nature is the chief drawback in most processes of paper making. The recent development in Europe, especially in Sweden and Norway, of the sulphate process, however, and the superior quality of the product made from resinous woods has turned atention to longleaf and other southern pines as a possible source of pulp in this country. These pines have long, thick-walled fibres, and also high specific gravities, implying large yields per cord, and therefore seem particularly adapted for the manufacture, at low cost, of strong wrapping papers. The waste from the lumber industry in the South suggests a source of cheap raw material.

While the sulphate process can be used in the manufacture of bleaching pulps, its principal product is an undercooked, nonbleaching, brown pulp known as "kraft" pulp, the term, a German one, signifying strength. True to its name, this pulp produces a remarkably strong paper, very resistant to wear.

Kraft papers, which may be made by the soda as well as by the sulphate process, are especially adapted for wrapping purposes. Wrapping papers stand third among the paper products of the United States, being exceeded in amount and value only by news and book papers. In 1909 the production of wrapping papers of all kinds aggregated 764,000 short tons, with a value of $42,296,000. The value of wrapping papers imported in 1912 was $846,500. Complete statistics for recent importations of kraft paper are not available, but in 1908, three years after its introduction into the United States, the imports amounted to between 10,000 and 12,000 tons. In 1912 the imports of unbleached sulphate pulp from Sweden alone were approximately 21,600 short tons, and from Norway 8,400 short tons.

Manila wrapping papers, including the better imitation manilas, have generally been considered the strongest and best wearing, but the light-weight kraft papers give the same service as manilas almost twice as heavy. Although strong, light-weight wrapping papers are made in this country from sulphite pulps, the imported kraft papers and papers made from imported kraft pulps have proved too formidable competitors for even the best wholly-domestic product of this kind. The immediate success and largely increasing use of kraft products has brought on the market imitations, colored to resemble the genuine, made from strong sulphite pulp or from such pulp together with ground, steamed-wood pulp. Although some of them are quite strong in the light weights, they are not equal to the genuine in other ways. The opportunity for devloping an increased domestic output of kraft products from native woods is apparent.

The above-mentioned conditions led the Forest Service to conduct a series of tests at the Forest Products Laboratory, maintained in co-operation with the University of Wisconsin, Madison, Wis., in order (1) to determine the suitability of the southern pines for paper pulps; (2) to ascertain the effects of varying cooking conditions in the sulphate process of pulp making; (3) to compare the sulphate process with the soda process. Only longleaf pine has so far been used in the tests, of which this bulletin gives the results under such preliminary analyses as have been made at this time.

Lumber Waste Available for Pulp Making.

The total stand of longleaf pine (privately owned) was estimated by the Bureau of Corporations in 1910 at 232 billion feet board measure, while for all southern pines the amount was placed at 384 billion feet. The lumber cut from these pines in 1910 amounted to 14 billion feet. The sawed lumber represents approximately one-half the volume of the log as it comes to the mill. Bark and saw-dust, which are valueless for paper making, constitute a large proportion of the waste, but it is safe to say that 20 per cent. of the volume of the log, exclusive of the bark, is lost in slabs, edgings, and trimmings. Tops and defective logs left in the woods and small logs which at present are converted into lumber with little or no profit would furnish a supply of raw material for pulp making even greater than that derived from the mill waste.

The waste wood mentioned is not as a rule the clean, clear material to which pulp mills have been accustomed. But when the soda and sulphate processes are employed, the presence of knots, pitch pockets and streaks, and remnants of decayed wood and bark are not very objectionable. The expense of handling and preparing slabs and other irregular sizes and shapes, however, is greater than for round pulp-wood, so the initial cost of such material must be low enough to offset the extra cost incident to its use.

Pulp Making Processes Applicable to Longleaf Pine.

Four or five mills are at present using southern pine mill waste for the manufacture of wrapping paper and similar products, three of which employ the sulphate process. Several other sulphate mills are either projected or in course of construction. Because of the resinous nature of the wood the preparation of paper pulp from longleaf pine is confined to the soda and sulphate processes, unless special extraction treatments are employed preliminary to cooking.

The soda process consists in digesting suitably prepared wood with caustic soda ($NaOH$) solution. The cooking results in dissolving the lignin and resin from one another. The action depends partly upon the direct solvent and saponifying power of the caustic soda, and partly upon the hydrolysis of the wood in the presence of water at high temperatures, forming organic acid products which unite with the alkali present. Cellulose, of which the fibres are chiefly composed, withstands the cooking action, except under very severe treatment.

The spent cooking liquor, or "black liquor," is separated from the pulp fibres and evaporated; the residue is calcined in a furnace, and the soda compounds are recovered as "black ash," an impure sodium carbonate (Na_2CO_3). This ash is dissolved in water, and the solution is causticized with freshly burned lime; the resulting caustic soda is again used in cooking. The losses of soda occurring in the operations are made up by adding fresh soda ash (commercial sodium carbonate) previous to causticizing.

The sulphate process is similar to the soda process, except that sodium sulphide (Na_2S) is employed as a cooking chemical in addition to the caustic soda. The sodium sulphide is derived from sodium sulphate (Na_2SO_4), which is added during the recovery operations to make up for the losses, and it is from this chemical that the process derives its name. The sodium sulphate is mixed with the black ash and subjected to a high temperature in a ''smelter''; this treatment reduces it to sodium sulphide, although the reaction is not complete. The ''smelt'' containing sodium carbonate, sosolved in water and the solution is causticized, as in the soda process, with lime, which has, however, little action on the sulphide and the sulphate. During cooking the organic acids produced react with the sodium sulphide, as wel as with the caustic soda, so that in calcining both chemicals are recovered as sodium carbonate. If desired, soda ash may be added to the smelt solution before causticizing in order to increase the proportion of caustic soda in the cooking liquors. Some mills have also found it advantageous to mix with the causticized cooking liquors some of the black liquors diverted from the recovery operations.

The soda and sulphate processes can be applied to extracted or steam-distilled chips from which rosin and turpentine have been removed. Turpentine can also be obtained from resinous chips during the cooking operations by condensing the ''relief'' from the top of the digester. However, the turpentine is very impure, and in the case of the sulphate process contains organic sulphur compounds from which it is separated with great difficulty.

Experimental Methods—Kinds of Tests.

The tests made by the Forest Service were of two classes: (1) Autoclave tests and (2) semicommercial tests. The autoclave tests comprised several series of cooks made to determine the effects of verying the cooking conditions of the sulphate process. The semicommercial tests include cooks made by the soda as well as by the sulphate process. The semi-commercial sulphate cooks employed such cooking conditions as the autoclave tests indicated would give good results, while the tests using the soda process were made with cooking conditions that would give results comparable to those obtained from the sulphate cooks. Because the semicommercial tests show in a more direct manner the possibilities of preparing paper pulp from longleaf pine, they will be discussed before the autoclave tests.

Wood Used.

The test material consisted of longleaf pine (Pinus palustris Mill.) from two localities, Perry County, Miss., and Tangipahoa Parish, La. A portion of the former, consisting of edgings containing approximately equal amounts of sap-wood and heartwood, was used for the semicommercial soda tests, and another similar portion of the same shipment was used for the autoclave tests. The average bone-dry weight of the wood used in these autoclave tests was 30.4 pounds per cubic foot green volume; the maximum and minimum values were 36.4 and 26.6 pounds, respectively. The wood was fairly free from resin. The remaining cooks employed two butt logs (15 and 22 inches diameter) of the Louisiana wood, including all of the sapwood and heartwood. These logs were quite resinous, but were free from knots. They had an average bone-dry weight of 35.5 pounds per cubic foot green volume. The maximum and minimum weights were 40.1 and 32.3 pounds, respectively, for the various determinations.

The material was prepared for cooking by removing the bark and sawing the pieces across the grain into sections five-eighths inch thick, which were then split into chips about three-sixteenths to one-fourth inch by 2 to 6 inches across the grain. The chips were screened to remove sawdust, and each lot was thoroughly mixed so as to be uniform throughout.

Apparatus.

The semi-commercial cooks were made in a vertical, stationary digester consisting of a cast-steel cylindrical shell with top and bottom cones, with a capacity of about 62 gallons. The digester was fitted at the top with a ''relief' 'or vent pipe, a pressure gauge, and a thermometer; and at the side with a gauge glass for noting the height of the liquor. The bottom was arranged for ''blowing'' the contents after cooking. Heat was furnished partly by passing steam directly into the digester at the bottom and partly by two steam coils regulated by admitting either more or less steam into the digester and by relieving any excess pressure by means of the top vent.

Th autoclave cooks were made in a horizontal rotary autoclave with a capacity of about 2 gallons. This vessel was made of a 6-inch steel pipe with blank flange ends, fitted with trunnions, to one of which was attached a pressure gauge. A screw-joint handhole opening in the side provided for charging. Heat was furnished by Bunsen-burner flames underneath the autoclave, and the pressures were regulated by increasing or decreasing the heat. The autoclave was not relieved during cooking, and no observations of temperatures were made. The cooked pulps were not blown, as in the case of the semicommercial tests, but the cooking vesesl was quickly cooled and the contents poured out.

Procedure in Testing.

The liquor charges for the sulphate cooks were prepared by mixing caustic soda and sodium sulphide solutions of known composition, as determined by previous analyses, together with water and dry sodium sulphate. The amounts of each constituent were taken in such proportions that when the whole mixture was charged, with the chips, into the digester or autoclave, the amounts of each chemical per pound of chips (bone dry basis) was in the desired proportion, and the concentration of chemicals in the digester liquor (including the water in the chips) was of the desired degree. For soda cooks the procedure was similar, except that caustic soda was the only chemical to be taken into consideration. The general procedure in conducting the tests was as follows:—

The chips to be used for a cook were sampled and weighed. By means of the sample the amount of moisture in the chips and the equivalent bone-dry weight of the charge were determined. The chips, together with the cooking liquors, were then charged into the autoclave or digester, and the vessel closed. After a cook was completed the crude pulp obtained was washed thoroughly, pressed to remove water, shredded, weighed, and sampled for determining its equivalent bone-dry weight. The pulp was then mixed with water and treated in a Hollander-style beating engine with the roll barely touching the bedplate (light brush) until the soft chips in the pulp had become disintegrated into fibers and the wet fibers had a smooth, slippery feel. The beater roll was then pressed hard down on the bedplate (stiff brush), and the beating operation continued until the pulp was suitable for making wrapping paper, as determined by its ''feel.'' The beaten pulp was then screened through the slots (0.012 inch width) of a diaphragm pulp screen. In all cases the screenings obtained were so small in amount that they were disregarded in the yield calculations. The semicommercial pulps were run over a Pusey and Jones 15-inch Fourdrinier paper machine into rolls of dry paper, while the autoclave pulps were made up into sheets on a small hand mold. The papers thus produced contained the experimental pulps alone, without the addition of any other materials.

Determination of Yields and Properties.

The yield of pulp (bone-dry basis) is usually expressed as a percentage of the bone-dry weight of the chip charge, both weights being determined as explained above. When yields per cord are given they are based on a "solid cord" containing 100 cubic feet of clear wood (green volume) having a bone-dry weight of 35.5 pounds per cubic foot; or 3,550 pounds per cord.

The strengths of the papers from the semicommercial pulps were determined by means of a Mullen paper tester, five "pop tests" being made on double thicknesses of each paper. The value is expressed as a "strength ratio," which is the average of the five test values in pounds per square inch divided by the average sheet thicknesses in ten-thousandths of an inch, and also as a "strength factor," which is the average of the five pop tests divided by the weight per ream of 500 sheets of paper, each measuring 24 by 36 inches. The relative resistance of the papers to wear was determined by crumpling the sheets in the hand, and all other properties mentioned, except strength, were determined by feel or by observation without the aid of instruments.

Sulphate Process.

The object of the semicommercial sulphate cooks was to secure the best quality of pulp with the highest possible yield. The severity of cooking employed depends largely upon the use for which the pulps are intended. If bleaching or easy bleaching pulps, such as are used in book and other white papers, are desired, more severe cooking treatments are necessary than if the pulps are to be used in natural-color wrapping papers. The present experiments apply more especially to the latter, for which the important properties are strength, toughness, and resistance to wear. The terms mild, medium, and severe cooking, and undercooked, well-cooked, and overcooked pulps used in the discussion are significant only with respect to the object of the tests.

Mild Cooking Treatments.

The less severe the cooking of a wood the larger will be the yield of crude pulp. However, there is a point at which the pulp will begin to lose its valuable properties for making wrapping papers. The crude unbeaten pulp from the mild cook was full of soft chips, which, while hard enough to resist the action of a stream of water under pressure could easily be picked apart with the fingers. The paper made from the beaten pulp had a strength factor of 0.50, was moderately tough, and had fair wearing properties. As a wrapping paper it would be considered of medium grade. The yield, 61.2 per cent or 2,172 pounds per solid cord, was very high, considering the quality of pulp obtained. Pulps produced under less severe cooking conditions had higher yields, but the quality was not so good, as evidenced by brittleness, lack of strength, and poor wearing properties.

Severe Cooking Treatments.

The effect of more severe cooking treatments, produced mainly by greater initial concentrations and amounts of active cooking chemicals, was evidenced by thoroughly cooked or overcooked pulps. The crude pulps were not only free from chips and shives, but also seemed to be soft and fluffy. The papers made from the beaten pulps, however, were of very superior quality with regard to resistance to wear, toughness, and strength, the strength factors being 0.91 and 0.86. Both pulps became slightly hydrated during the beater treatments, which produced a parchmentizing effect and increased the strength and toughness. Either of the papers could be rubbed or crumpled for a long time without becoming fuzzy, tearing, or showing signs of wear at the place of friction. The papers had also a soft, smooth, greasy, leather-like feel, and were light brown in color, like the imported kraft papers. The yields were rather low for sulphate kraft pulps. From 1,609 pounds per solid cord to 1,569 pounds per solid cord was the yield. Under still more severe cooking treatments longleaf pine pulps become very soft and gradually lose their strength and wearing properties.

Medium Cooking Treatments.

The above-mentioned cooks show approximately the higher and lower limits of yield in the production of pulps and papers of good quality. All things considered, the cooks clasesd with those of medium severity, gave the best results.

The crude pulps were slightly raw and contained some soft chips, which, however, broke up in the beater. The pulp in some cases was hydrated during the beating treatment to such an extent that the paper made from it had a parchment-like appearance, the individual fibers being scarcely distinguishable from each other. This paper had good wearing properties and was very tough, with a strength factor of 0.77.

Effects of Beating.

The mechanical treatment given a kraft pulp has as important an influence on the properties of the resulting paper as the cooking treatment itself. A crude pulp which appears to be of little value can be made into strong high-grade paper if the proper beater treatment is employed, while the best pulps can easily be ruined by improper beating. The use of kollergangs or edge runners preliminary to actual beating, or of stone rolls and bedplates in the beaters, and the determination by successive tests of the refining and beating treatments best adapted for a particular pulp undoubtedly would have resulted in papers of much better quality than those obtained. Nevertheless, many of the experimental papers were equal or superior to commercial kraft papers.

Soda pulps from longleaf pine tend to be soft and fluffy, even when slightly undercooked, or chippy. Proper beater treatments will remedy this to some extent, but the pulp does not become so well hydrated nor attain the same smooth, greasy feel during beating as the sulphate pulps, and the resultant papers do not show the parchmentized effect so characteristic of the sulphate papers. On the paper machine soda stock runs "free," while sulphate stock runs "slow," provided, of course, both kinds of stock are handled similarly in the beater.

The soda papers were inferior to the sulphate papers in resistance to wear; the latter could be rubbed and crumpled for a long time without showings signs of wear, while the former had a tendency to become fuzzy and tear under similar treatment. Even those sulphate pulps at very high yields had wearing qualities equal to the best soda pulps. There is little doubt that higher yields of good kraft pulp can be obtained with the sulphate process than with the soda process. Sulphate pulps of fairly good quality can be obtained with yields as high as 61 per cent, while the limit for soda pulps is approximately 50 per cent. With higher yields the soda pulps lose strength and toughness and become brittle. A sulphate pulp with a 60 per cent yield can be made into a medium grade of kraft wrapping paper, while a soda pulp having the same yield will produce only a very inferior grade. Considering bursting strength alone, equally strong papers can be made by either process.

The main advantage of the sulphate process over the soda process is that in the former the pulp can be very much undercooked and still produce a fair quality of paper, while a soda pulp must be comparatively well cooked before a good paper can be made from it. Moreover, the best sulphate kraft pulps were obtained with a total duration of cooking of only 3.5 hours, while in the soda tests 6 hours were required to secure the best results.

Autoclave Tests.

The autoclave tests, which, as previously explained, preceded the semicommercial tests, were made to determine the effects of varying the cooking conditions in the production of sulphate pulp. The cooking conditions investigated were:

(1) Amounts of the various cooking chemical employed.
2) Cooking pressures or temperatures.
(3) Durations of cooking.
(4) Initial concentrations of chemicals in the digester liquors.

Aside from the chemicals normally present in sulphate cooking liquors—that is, caustic soda, sodium sulphide, sodium sulphate, and sodium carbonate, the effects of sodium chloride and sulphur in conjunction with caustic soda were studied. The tests, Tables 4 to 10, inclusive, were made in series, in any of which all cooking conditions except the one under observation were held as nearly constant as possible.

In the experiments, the effects of vary amounts of caustic soda and of sodium sulphide, and the influence of sodium carbonate, sodium sulphate, and other chemicals and combinations, as well as the effect of varying temperatures, durations of cooking etc., were noted.

The summary of conclusion from the autoclave tests were:—

(1) The effective cooking chemicals in sulphate cooking liquors are caustic soda and sodium sulphide, the former being the more drastic in its action. Sodium sulphate and sodium carbonate, which unavoidably occur in the commercial liquors, are of no assistance in cooking, at least so far as the wood of longleaf pine is concerned.

(2) Increases in the amounts of either caustic soda or sodium sulphide, or both, result in more thorough cooking. The same effect may be obtained by increasing either the cooking pressure, the duration of cooking, or the initial concentrations of the chemicals in the cooking liquors.

(3) More thorough cooking is evidenced by decreased yields and by lighter colored pulps until a condition of very thorough cooking is reached, after which the color of the pulp is not affected.

(4) The best, or well-cooked, sulphate kraft pulps will have good strength and wearing properties, will be light brown in color, and will have a smooth, firm leather-like feel when properly beaten. Undercooked pulps are characterized by a darker brown color, brittleness, lack of strength, and poor wearing properties. Overcooked pulps are light gray in color and may have good strength and wearing properties when properly beaten, but the yield will be low. Pulps much overcooked, in addition to being light gray in color, will be soft and fluffy, with little strength.

(5) With each different combination of the cooking conditions there is a definite minimum amount of sodium sulphide which must be used in conjunction with the caustic soda present to impart to the product the high strength and good wearing properties characteristic of properly cooked sulphate kraft pulps.

(6) The use of sodium chloride in conjunction with caustic soda improves the quality of the pulp to a slight extent only. The similar use of sulphur results in pulps having properties practicaly the same as those of sulphate pulps.

(7) As the proportion of sodium sulphide in the digester charge is increased, the disagreeable odor produced in the cooking operations becomes more pronounced.

Practical Significance of the Experiments.

While the present experiments are not complete, they show conclusively (1) that longleaf pine is well adapted for the manufacture of natural-color kraft pulps and papers; (2) that the sulphate process of pulp making applied to this wood affords products of better quality and of higher yields than the soda process; (3) that kraft papers can be made from longleaf pine equal or superior in quality to the imported and domestic kraft papers now on the market; and (4) that the high gravity of the wood and the resultant high yield of pulp per cord give longleaf pine an advantage possessed by few, if any, other commercially important woods suitable for pulp making.

The autoclave tests indicate that there should be a certain combination of values for the variable cooking conditions which will result in the most economical method of operation. However, other factors than the variables thus far investigated must be taken into consideration in determining what this combination is. For example, the proper degree to which a pulp must be cooked will depend partly upon the cost of the beater treatment. With cheap power for beating, the pulp need not be so severely cooked as when the cost of power is high. The best concentrations and proportions of chemicals in the digester liquors will likewise depend upon the efficiency of the recovery system and the method of operating it.

NEW SALES MANAGER.

The Brunet Falls Manufacturing Co., Cornell, Wisconsin, whose business is the manufacture and sale of wood fibre wallboard under private brands to the jobbing trade, have secured the services of Mr. E. W. Cowell, long associated with roofing manufacture and sales, to conduct the sales of their wallboard business. This firm is shipping large quantities of their board into Western Canada, where it is being received with favored by the trade.

UNITED STATES NOTES

(Special to Pulp and Paper Magazine).

Fire starting at 9.30 on the night of May 20th, in the elevator on the second floor of the Columbus Waste Paper Company's building at Spring street and the Hocking Valley Railway tracks, Columbus, O., swept through the rear of the structure, igniting piles of inflammable material stored there and inflicting a loss estimated by Fire Chief Lauer at $10,000. When the night watchman noticed the fire the flames were leaping from second-story windows. He turned in an alarm and hurried to the stable in the rear, where three horses were kept. With the arrival of the firemen the horses were rescued just in time to escape the flames. The stable and a storeroom in the rear were destroyed. The interior of the main building, a three-story brick, was gutted and about half of the roof collapsed. The waste paper concern is owned by the Selby Company of Cleveland. The contents of the building were worth about $35,000, a total loss, as insurance is not given on such material.

Mr. Thomas C. Bermingham, sixty-four years old, president of the Bermingham & Seaman Paper Company, dropped dead in his office in the Tribune Building, in Chicago, on May 20. Heart disease, superinduced by the heat, is said to have been the cause of the death.

The directors of the Hutchinson Boxboard & Paper Company held a meeting last month at the Commercial Club rooms in Hutchinson, an. Manager Lee Wilson met with the board and made a report of the work being done. The reports were excellent, showing that the big plant is working full time and in a prosperous condition.

Announcement has been made at Lockport, N.Y., of the resignation of Joseph H. Eilers as manager of the United Boxboard Company's local plant, and of his succession by Timothy J. Neville. Mr. Neville was employed for about ten years in various capacities at the Lockport plant before leaving there, and his numerous friends will no doubt be pleased to learn of his promotion to the position of head of the United's mills. His plans for the future Mr. Eilers is not willing to make public at the present time.

Six steamer loads, or 4,000 cords of pulpwood, consigned to the Hammermill Paper Company, were unloaded by Caulfield & Grant last week. In the opinion of the harbor master, the lumber shipments during the week have been greater than during any other similar period in years. Many thousand feet of lumber have been unloaded on the public dock at Erie, Pa.

The Treasury Department at Washington recently made a ruling to facilitate the importation of paper at the lowest possible rate of duty. Under the retaliatory provision of the paper schedule in the Underwood Tariff Act, regulations were drafted requiring the importer to disclose the name of the manufacturer and the place of manufacture of the paper, so that the customs officials might be able to tell whether the paper was entitled to the lower duty. In the case of the importation of paper by the Perkins-Goodwin Co., which for trade reasons did not wish to disclose the names of the manufacturers, the Treasury Department ordered that the name of the manufacturer in this and similar cases be waived. Customs officials were directed to accept instead the affidavit of the importer as to the place of manufacture of the paper and the province of origin of the wood from which it was made.

The Crocker-Burbank & Company, Inc., one of the largest plants in the State of Massachusetts, gave the employees a pleasant surprise last week by announcing that an extra dividend of 5 per cent. of the gross earnings of the factories of the company for the year ending June 1 would be given to every man employed. The amount to be distributed will total several thousand dollars, according to the information given out by the officials. The company a few years ago established the profit-sharing system, the money to be given about Christmas time each year. The announcement came in answer to the demand that was recently made to the officials for an increase of 35 cents a day made by the paper makers.

At the annual meeting of the stockholders of the Champion Coated Paper Company and the Champion Fibre Company, held at the Champion Coated Paper Company's office at Hamilton, Ohio, old officers and directors were re-elected as follows: Champion Coated Paper Company—Peter G. Thomson, President; Peter G. Thompson, Jr., Vice-President; Walter De Randall, Secretary and Treasurer, and Peter G. Thomson, Jr., and Alexander Thomson, Harry G. Poundsford, J. C. Hooven and Walter De Randall, Directors. Champion Fibre Company—Peter G. Thomson, President; Peter G. Thomson, Jr., Vice-President; C. S. Bryant, Secretary and Treasurer; Walter De Randall, Assistant Secretary and Treasurer, and Peter G. Thomson, Peter G. Thomson, Jr., J. G. Schmidlapp, W. C. Proctor, Alexander and Logan Thomson and Walter De Randall, Directors.

Upon the application of William S. Hilles, attorney for the Smith, Dixon Company, a Maryland corporation, in the Court of Chancery, at Williamsport, Pa., Chancellor Curtis last week appointed a receiver for the Shepherd Paper Company, a Delaware corporation. The plaintiff alleged that they were creditors of the defendant company for a considerable sum which is overdue, and that the defendant company is unable to pay its debts. The defendant company, represented by Reuben Satterthwaite, Jr., admitted the allegations by the plaintiff. James Thompson was appointed receiver for the company.

While working last week in the mill of the River Basin Paper Company, at Monroe, Mich., Daniel Dushane found a diamond worth $700 that had been lost a few weeks before in Pittsburgh, Pa. The diamond, which was a two-karat stone, disappeared from the work room of a Pittsburgh diamond company and every effort made to find it failed. The company concluded that the diamond had fallen to the floor and been swept up with the waste paper. All of the waste paper from the store was sold to the Salvation Army and the Army officials remembered that practically all of the paper they collected at the time the diamond was lost had been sold to the River Basin Paper Company. The Paper Company was notified and a $75 reward offered for the recovery of the diamond. Dushane found the diamond in the sand box of the beater room. He was paid the reward.

At Washington, D.C., the Civil Service Commission has announced an examination for a chemist's aid in the Bureau of Chemistry, Department of Agriculture, to be held on July 8th. Both men and women are admitted to the positions, but most of the appointments require men for the work. Elementary chemistry, including simple problems in qualitative and quantitative analysis, chemical calculations and practical laboratory manipulations, or simple elementary physics will count as 70 per cent. of the examination and education and experience the remaining 30 per cent. Applicants for the examinations must be between 18 and 30 years old. The commission has also announced that an examination will be held on the same date for a timber scaler. The examination requires that the applicant must have had at least three years' practical experience in lumbering operations. Further, that applicants must be physically able to do hard field work in connection with scaling and logging operations. The job will pay $90 a month.

The Wausau Abrasive Company of Wassau, Wis., is the name of a new concern started at that place last month, the incorporators being P. W. Sawyer and R. E. Chartier. The company is capitalized at $50,000. The new concern has purchased the holdings and property of the Wausau Sandpaper Company. The new plant will begin operation in the near future with fourteen hands. The company has decided to give its entire attention to high grade abrasive papers only, and will give no time to the cheaper grades of flint papers made by its predecessor.

At the last meeting of the Board of Directors of the International Paper Company, 30 Broad street, New York, F. G. Simons was elected secretary to succeed E. W. Hyde. Mr. Simons has been with the company for some time in the capacity of assistant secretary, and will, it is stated by all concerned, shortly become more valuable to the company.

The time set for completion of the reorganization of the Remington-Martin group of paper mills in Northern New York, has been extended by Judge Ray of the U. S. Court at Watertown, before whom the bankruptcy proceedings of the group are being heard. In connection with the orders of adjudication Judge Ray has ordered that the bankruptcy proceedings remain before him, and there will be no order of references to referees in bankruptcy for the present. The adjudication of the paper concerns will not interfere in the least with the negotiations to bring about a settlement of the troubles of the three companies. It is expected that further proceedings will be held in abeyance until some plan is evolved by the creditors' committee to put the companies on a sound financial basis and then steps will be taken towards dismissing the proceedings now pending in the United States Court. Receiver Mark S. Wilder will be continued in charge of the three companies. In the event of the creditors' committee being unable to straighten out the affairs of the companies, the usual course in bankruptcy is for Judge Ray to send the three cases to the referees in bankruptcy, the companies will file a schedule of creditors, and then general meetings of the creditors will be called to elect a trustee.

The Industrial Moving Picture Company has recently completed a two-reel subject comprehensively showing the paper industry, from the time the trees are cut in the forest until the finished newspaper is in the hands of the public. The pictures were taken at the plant of the Minnesota & Ontario Paper Company. International Falls, Minn., for Peabody, Houghteling & Co., of Chicago. They will be used as a feature of the large educational campaign to be conducted by Peabody, Houghteling & Co.

The Paper Manufacturers' Selling Company of 5 Beekman street, New York City, has taken the agency for several lines of foreign pulp. A variety of grades of sulphite, both bleached and unbleached, are on hand. The company also has the agency for several grades of sulphate and kraft pulp. A special line is known as an opaque pulp, which is a bleached sulphite used in the manufacture of thin and opaque papers. The concern has also added to its line the agency for foreign manufacturers of light weight book and writing papers and glazed and machine glazed wrappings.

An application was filed in the county clerk's office at Troy, N.Y., last week showing that, by unanimous consent of the voting trustees of the Fort Orange Paper Company, at Castleton, the capital stock of the company has been increased from $200,000 to $400,000 and the new issue classified into $200,000 preferred and $200.000 of common stock. The certificates are signed by Emmon Bryant as President and M. S. Downey as Secretary of the company.

Alexander Humphries, assistant superintendent of the Mount Ida mill of the John A. Manning Paper Company, at Troy, N.Y., who recently resigned his position to go back to his home in the north of Ireland, was presented last week with a purse of $50 in gold by mill employees; John Durrah, President of the Papermakers' Union, made the presentation speech. Mr. Humphries is only thirty years of age. He has amassed considerable money in this country for the last twelve years, and goes back to Ireland to engage in the real estate and milling business, and also to remain with his mother during her declining years.

The building of the American Paper Box Company of Grand Rapids, Mich., is being rapidly pushed along, and if everything goes as expected, it will be finished by July 1st. The plant consists of three structures. The paper box factory will occupy one portion of the plant, the Illinois-Michigan Fibre Company the second plant, and the American Corrugating Company the third structure. The building is the property of the Manufacturers Realty Company. A big tunnel will connect the various plants.

At a special meeting of the stockholders of the Robert Gair Company, manufacturers of paper goods, in Brooklyn, N.Y., it was voted to increase the preferred stock from $2,000.000 to $2,500,000. The present common stock is $5,000,000. Holders of 14 of the old shares will be allowed to subscribe at par for one share of the new preferred. The additional capital will be used to finance the new buildings of the company. A new nine-story concrete fire-proof building is now being occupied with the offices and some of the warehouses, although it is not quite finished with regard to interior construction.

The status of the case between the International Paper Company and its employees is embodied in the following statement recently made by Hugh Frayne, general organizer of the American Federation of Labor, who is chairman of the labor committee which has been conferring with the company: "At our last conference we submitted a proposition that all points which we failed to settle be referred to arbitration. Some time later we received a reply from the company, which was to a certain extent an arbitration proposition. But this proposition is so widely different from ours as to what should be arbitrated that we could not undertake to pass on it, and have referred it to the unions. When we get instructions from the unions we will have another conference with the company.''

Dr. G. E. Hathorne, of Bangor, Me., has been appointed inspector for the forest fire service in the territory between Norcross on the west branch of the Penoboscot River and St. Francis on the St. John River. Dr. Hathorne was chief warden in the Chesuncook Lake region, where the Great Northern Paper Company has large and valuable holdings, last season. Accompanied by one deputy he will visit all the lookout stations, and each patrolman in that section, covering the West Branch, the Allagash and St. John Rivers. They will carry a complete camping equipment and supplies for a long stay in the woods.

SCHOPPER'S STRENGTH TESTER A RAPID TESTING APPARATUS.

A complete strength test with this apparatus occupies very much time in many cases. The following rapid method affords a sufficiently exact test. Cut only one strip from each direction of the paper to be tested, add the two breaking loads ascertained in kg. and divide by 3 times the weight per square metre in grammes. In order to obtain the breaking strength in metres the number obtained must be multiplied by 100,000.

Possible errors can only arise owing to only one strip instead of 5 being used and thereby obtaining an average which is not sufficiently exact. In addition, the percentage of moisture in the paper is not taken into consideration. As found by experience, the percentage of moisture in a paper with a relative percentage of atmospheric humidity of 65 per cent. fluctuates between 7 and 10 per cent. The result of the rapid test will therefore be about 5 per cent. too low. So if the required breaking-strength is determined about 5 per cent. less by the rapid test, in order to be on the safe side a complete test must be made.

The above-mentioned formula is calculated as follows—

$$\frac{\text{Breaking length R}}{\text{Length of strip}} = \frac{\text{Breaking load B}}{\text{Weight of strip.}}$$

Weight of strip = length of strip × breadth of strip (1.5 cms) × weight per square metre.

$$\text{Thus R} = \frac{\text{B}}{\text{1.5 weight per square metre.}}$$

$$\text{The average breaking length} = \tfrac{1}{2}\,(\text{R}_1 + \text{R}_2)$$

$$\text{or } \tfrac{1}{2}\,\frac{\text{B}_1 + \text{B}_2}{1.5 \times \text{weight per square metre}}$$

$$= \frac{\text{B}_1 + \text{B}_2}{3 \times \text{weight per square metre.}}$$

For the purpose of increased accuracy it is preferable to state the breaking load B in g. instead of in kg. and the breadth of the strips in mm. instead of in cms. On calculating according to the formula the breaking-length is then obtained directly in km. which suffices for purposes of comparison. Besides the advantage of greater distinctness the insertion of mm. instead of cms. for the breadth of the strip has the advantage that the formula can also be used for breadths other than 15mm. which actually occurs in practice. When the values are stated in g. or mm. the possibility of errors occurring in calculating the decimal places is likewise diminished, which is of special value as both breaking lengths of more than 10 000 m. and also those down to 100 m are ascertained.

When performing this rapid test it is preferable to tear at least a second control strip out of each of the two directions of the paper. Further, the separate determination of the breaking length of each of the two directions of the paper is desirable in many cases. The error due to neglecting the percentage of moisture of the paper during this rapid test can be avoided by taking the paper approximately dry from the paper-machine. (This proposal has much to recommend it, but the paper taken absolutely dry from the machine will result in quite different values, particularly as to the number of folds and dilatation, than those obtained with the same paper moistoned and calendered.) The weight per square metre is generally already determined by the sheet torn by the machine tender.—Papier Fabrikant.

NEW COURSE IN PAPER MAKING.

(Special to Pulp and Paper Magazine.)

Bangor, Me., June 10, 1914.—A full outline of the new curriculum in pulp and paper chemistry now offered at the University of Maine appeared in an article contributed to ''Paper'' by Professor Ralph H. McKee, head of the department of chemistry. Professor McKee asks suggestions from the trade regarding the various courses included. He also explains briefly that inasmuch as a large proportion of the graduates of the department of chemistry are attracted to the pulp and paper industry as a life work, the University is filling a long felt want by the establishment of these courses. The strong departments of chemistry, forestry, botany, and engineering, together with the position of the University within 10 miles of sulphite, soda, and mechanical pulp mills and paper mills of all kinds make it peculiarly fitted to undertake this work.

''The curriculum is so balanced,'' says Professor McKee, ''that a student will be well grounded in pure and applied chemistry, on the principles of which these industries are largely based; he will have a working knowledge of engineering that should enable him to understand and appreciate the mechanical details and other problems in the construction and operation of mills and machinery, and he will also have the ability to read French and German languages, which are necessary to the highest success. Students will be admitted who have completed four year high school courses including certain prescribed subjects.''

The laboratories of the new courses will be in Aubert Hall, the new building for the departments of chemistry and physics. Here all the processes involved in making actual paper will be gone through, working models of actual machinery having already been installed. The courses, as the first of their kind in the country, have attracted a great deal of favorable attention from the paper trade journals.

BRITISH TRADE NEWS

SPECIAL TO PULP & PAPER MAGAZINE

(Special to Pulp and Paper Magazine.)

London, June 2, 1914.

During the past couple of weeks several Canadians have been paying their annual business visit to London. The visit includes a round of calls on paper and pulp men in the English capital, and in the course of another few weeks a number of Englishmen leave for their annual tour in United States and Canada. A visitation from Canadians is always appreciated, and no doubt, from a business point of view, it always proves successful.

New Paper Making Process.

As is well known, the main basis of paper manufacture in the British industry—especially the newsprint quality—is mechanical and chemical pulps, while the better-class papers are produced with the help of rags and esparto grass, the latter commonly grown in subtropical countries, like Northern Africa. But with regard to production from esparto grass, the difficulty heretofore has been to get a satisfactory "bleach." We are assured now that this difficulty has been overcome (as it has been as regards paper produced from mechanical and chemical pulps) and a syndicate has been formed for the purpose of developing the new process. So far very little is known of the new process, but it is reported that the commercial result is likely to have an important bearing on the esparto trade.

River Pollution.

In view of the question of river pollution now arising in Canada a recent decision is interesting as it shows how strong the law is in England on anything likely to disturb a paper mill.

River pollution is one of the crucial questions paper makers have to deal with in the British paper industry, but it is satisfactory to know that their interests are pretty well safeguarded by the Government. Messrs. Charles Marsden and Sons, Ltd., the well-known papermakers, have just contested an interesting point for the protection of their Dearne paper mills, which arose on a motion in the Chancery Division of the High Court of England. It appears that two industries that are being worked on the River Dearne, near to the Dearne Paper Mills, are polluting the water, and Messrs. Charles Marsden asked for an undertaking that the offence be at once discontinued. This was given, but since it has transpired that during heavy rainfall sludge overflowed into the natural stream—the defendants say by no fault of theirs—and Messrs Marsden at once applied to the High Court for protection. The judge said in his descretion he believed he was fully entitled to grant a writ of sequestration against the defendants, but he did not propose to take that extreme step. He would instead grant an injunction till the trial of the action at law between the plaintiffs and defendants, the injunction being directed against the defendants and their servants. He did so in order that there might be further remedies against persons other than the defendants.

A Sudden Strike.

From time to time references have appeared in the Pulp and Paper Magazine of the doings of the National Union of Paper Mill Workers, and other bodies affiliated to it, and a recent action is worth recording. A few weeks ago Messrs. Peebles and Son, Ltd., of London and Rishton, intimated to their mill hands that owing to the unsatisfactory working of the three-shift system—a problem they were trying to solve for the benefit of the firm, as well as for the workers—the system would be discontinued in two weeks' time and a reversion would be made to the two-shift system. This naturally meant unemployment for some of the workers, but Messrs. Peebles and Son, Ltd., if they can help it, never like to see a man unemployed, and without any cause whatever the members of the Union refused to start work, bringing to a stand-still the Art and Chromo branch of the works belonging to the firm. The officials of all the unions, without delay, held a meeting and the illegal action of their members was denounced—in fact there was sheer defiance of the union officials, as a result of which 300 hands were thrown idle, entailing severe loss to Messrs. Peebles & Son, Ltd. Eventually the dispute was settled in London, and work is now proceeding on peaceful lines. The action of the union workers, however, shows the independent attitude members of the unions adopt during a critical period, and there is no doubt they were of the opinion that the strike would receive official sanction. Another point about the strike is that this mill of Messrs. Peebles is the third within three months to revert back from the three-shift system to the two-shift system, which proves that in the British paper industry the three-shift system—of which there has been a great deal of eulogy recently—is a failure.

Newsprint.

In London all the big daily papers are falling out with each other over the question of circulation—that is, the number of copies of each paper bought and sold in one day. It is somewhat difficult to arrive at the actual circulation of one particular paper, but it may be assumed that journals like The Times, the Daily Telegraph, Morning Post, Daily Mail, Sketch, Daily Mirror, Chronicle, Daily News, and Evening News have enormous circulations daily. The Telegraph, Mirror, and Evening News have their own paper mills, and The Times, as well as the Evening News, announces that there is a desperate struggle to obtain a sufficient quantity of paper of the famous hard white quality associated with The Times. An unusually large supply of paper was manufactured by W. V. Bowater, Ltd., the London Paper Mills Co., Ltd., Northfleet Paper Mills, Albert E. Reed and Co., Ltd., James Spicer & Son, Ltd., Townsend, Hook and Co., Ltd., and James Wrigley and Son, Ltd., makers of The Times paper for generations, but it is now contended that since The Times was reduced to two cents the demand for paper for it, along with the Evening News and Daily Mail, has meant other paper mills coming to the rescue, but the difficulty is to get the right quality of paper for which The Times is renowned. The proprietors of The Times say: "It is a temporary disadvantage, and will pass away as soon as the new papermaking machines are in operation." This means, of course, that some of the mills have had to erect new papermaking machines to cope with the newsprint demand. It is also worth recording that some months ago reference was made in these notes to the necessity of a hard white newsprint in the British market, similar to that which Canada is sending into the United States market. In fact, English printers often ask for the American paper with the "good surface"—really the Canadian product —as it shows up printing work better.

Becker and Co., Ltd.

Mr. Gorge v. d. Busche, President, occupied the chair at the sixth ordinary general meeting of Becker and Co. Ltd., held on May 14th. A gross profit of £25,460 was reported, and, after allowing for various charges, the net profit stands at £10,115 on the past year's trading. Messrs. Becker are the largest wood pulp importers in England, and Mr. Fred Becker, in moving the adoption of the annual report, said that when the company £1,800.000 in orders on the books. In the first balance- was first floated they showed on the prospectus sheet it was £1,900,000, and the goodwill took about 3 per cent. of the orders on the books. Today, in the 6th year, having £4,693,913 orders on the books, the goodwill had dropped down to practically one per cent. "In closing the books," he added, "on March 31st they always had a considerable stock of overlying goods for the benefit of their customers. Today the value of their stock in England was £310, and in France £2,730." Everything points to the fact that Messrs Becker and Co., Ltd., have had a very successful year.

Wood Pulp Imports.

The imports of wood pulp declined during April, but it is fully anticipated they will show a good rise during May. The imports were as follows for April:—

	1913 Tons	1914 Tons
Chemical	17,674	19,584
Mechanical	42,627	31,621

January to April—

	Tons	Tons
Chemical	84,179	83,403
Mechanical	156,933	135,501

Of the mechanical 3,600 tons were received from Canada in April, compared with 1,376 tons in April, 1913, and 9.262 tons between January and April, as against 2,572 during the same period last year.

London Exhibition.

For the past two weeks a very successful exhibition of printing machinery and paper requisites has been held in London. There was a good display of dandy rolls and appliances for loading, unloading and piling papers, whilst Messrs. Bertram's, Ltd., of Sciennes, Edinburgh, showed their patent carton skellet and cardboard box making machine, which manufactures cartons and skellets finished direct from the reel of cardboard at a very high speed—about 30,000 per hour. The North Cornwall China Clay Co. had their model of an old china clay works on view. Several paper making firms exhibited specimens of what their mills can turn out, and, taken all round, the exhibition was interesting throughout. Of course, it was intended mostly for printers, but the papermakers lost no opportunity in taking a part in it.

Synthetic Rubber.

A process is being developed at Handforth for the production of synthetic rubber, the basis being cellulose. Experiments are to be carried out on an elaborate scale, and to achieve this object a small corporation has been formed to finance the scheme.

TO PREVENT FOREST FIRES.

Many residents of the Laurentian country, some from points as far distant as Lac Tremblant and Huberdeau, gathered at the Montreal Amateur Athletic Association on the evening of June 4th to discuss the formation of some organization to cope with the growing menace of forest fires, which were particularly prevalent during the past month. The Canadian Northern and Canadian Pacific Railways were represented together with a number of clubs and associations with headquarters in the district affected.

The result of the meeting was the election of a committee to draw up a plan for the formation of an association to carry on the work of securing protection from fires. The methods to be adopted were not settled, but some of them were indicated in the addresses delivered by Mr. James Lawler, of the Canadian Forestry Association, and Mr. Ellwood Wilson, Chief Forester of the Laurentide Paper Company and vice-president of the St. Maurice Fire Protection Association, which guards seven million acres.

These methods include the engaging of fire rangers and the erection of lookout stations at strategic points. The work of educating the farmers and settlers throughout the region as to the danger and loss caused by carelessness will be taken up. Similar plans are being adopted by the Lower Ottawa Association which was organized a few weeks ago. An appeal to the Government for more efficient protection will also be made, the present force of fire rangers being, it is stated, insufficient and poorly distributed.

The committee appointed to go further into the matter consists of R. A. Outhet, chairman; F. Whittal, secretary; A. Ayres, Col. Starke, J. R. Innes, Mr. Allen, representing the C.P.R., and Mr. Guy Tombs, representing the C.N.R.

AFFAIRS OF NORTHERN ISLANDS COMPANY.

That the creditors of the Northern Islands Pulp Wood Company, of Port Arthur, which made an assignment some months ago to G. T. Clarkson, of Toronto, will receive about 31 cents on the dollar is the statement of the assignee. The assets of the company have been sold to F. H. Macpherson, representing the Detroit Sulphite Company, which is one of the large creditors.

NEW PATENTS

PAPER MAKING MACHINE.

Clifton V. Barret, of Little Falls, N.Y., U.S. Patent No. 1,098,704, June 2, 1914.

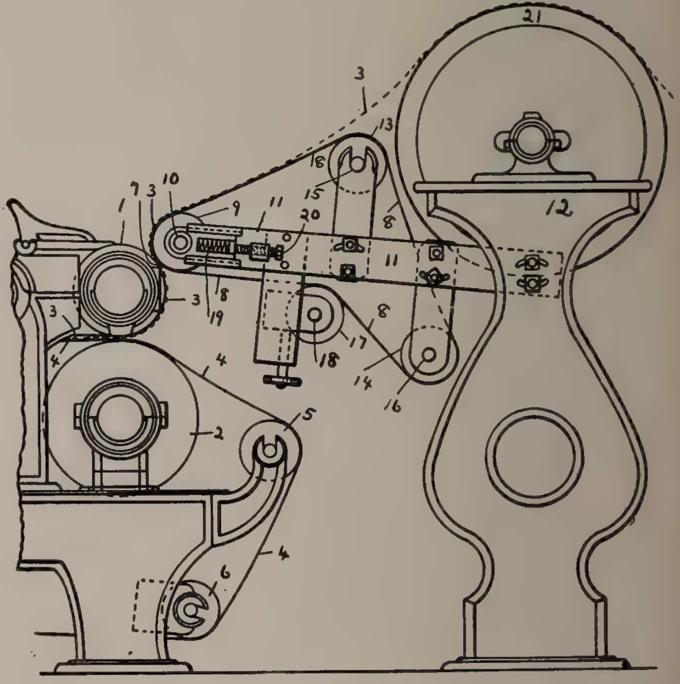
My invention relates to paper-making machines and its purpose is to provide an improved device for more effectively transferring the web of paper from the press rolls to the first drier.

Heretofore, especially with thin paper, difficulties have arisen in successfully taking the web of paper from the last press roll to the first drier. In the ordinary paper-making machine the web of paper is passed through the last pair of press rolls on the surface of a wet carrier from which it is separated immediately after passing between the press rolls by adhering to the ~~press roll with~~ which it has come in contact and from which it is taken by means of its own tensile strength and led to the first drier. On account of the weakness of the web of paper at this stage of its manufacture, the web is often broken or torn by reason of its adhering at some point to the last press roll more tightly than usual. This happens especially with thin paper when a piece of pulp of greater thickness than usual or a particle of dust, dirt or other foreign substance gets into the paper and is pressed against the press roll. I overcome these difficulties and add to the efficiency of the machine by providing a movable felt pressed by a yieldingly tensioned roller against the web of paper upon the press roll. To this felt the paper adheres, leaving the press roll, and is carried on said felt toward the first drier and from which felt the paper is easily separated by its own strength.

The drawing is a side elevation of part of a paper-making machine embodying my invention.

1 and 2 represent the upper and lower press rolls respectively, or the last pair of press rolls if more than one pair are used, between which the web of paper 3 is carried on its progress from the paper forming end of the machine (not shown) by a supporting or carrying felt 4. After passing between these press rolls the carrying felt 4 is led downwardly over idler rolls 5 and 6, and then back to the paper forming end of the machine. In passing between the press rolls 1 and 2 upon the surface of the carrying felt 4, the web of paper 3 has been pressed with great pressure directly against the face of the upper press roll 1 to which the paper adheres and is carried upwardly thereon to a joint 7 preferably a little above the axis of this press roll 1. At this point 7 the side of the web of paper away from the press roll 1 comes in contact with a movable felt 8 which is mounted upon and pressed against the paper by a spring pressed roll 9 journaled in bearings 10 slidingly located on a frame 11 which is pivotally and adjustably supported in position as by having its other end suitably secured to the drier frame 12. This endless felt is supported on carrier rolls 13 and 14 journaled in bearings 15 and 16 respectively, provided upon the frame 11 and passes over a take-up and guide roller 17 also journaled in suitable bearings 18 upon the frame 11. In addition to the weight of the frame 11 and its supported rolls, yielding tension means such as springs 19 and adjusting screws 20 acting thereupon, are provided for keeping the roll 9 at all times close enough to the upper press roll 1 as to press the transfer felt 9 with sufficient pressure upon the web of paper 3 on the press roll 1 to effect the transfer of said web to the felt 8 and also to transmit motion to said felt equal to the motion of the press roll 1 and the web of paper 3 thereon. Upon coming into such pressure contact with the felt 8 at point 7 the web of paper 3 leaves the upper press roll 1 and adheres to the tranfer felt 8 upon which it is carried part way toward the first drier 21 and then easily led by its own tensile strength from the transfer felt 8 to the first drier 21 over and from which it proceeds in the usual well-known course.

I find that my device overcomes the difficulties mentioned in that the web of paper is surely transferred from the last press roll to the transfer felt and from that to the first drier without being torn even though larger particles of pulp than usual or foreign matter may be present in the web of paper.



A part of the pressure for the contact of roll 9 with the paper 3 upon the roll 1 may be obtained by having the frame 11 pivotally mounted upon the drier frame 12 so that a large portion of the weight of the frame 11 and the rolls 9, 13 and 14 will be carried at the contact point of the roll 9 with the roll 1. By reason of this, weight coming upon the roll 1 at the point indicated, it exerts a very powerful pressure but one that may yield when needed. The spring 19 adds further resiliency to the pressure.

What I claim as new and desire to secure by Letters Patent is:—

1. In a paper-making machine the combination with a final press roll carrying directly on its surface a web of paper, of a movable transfer felt brought into con-

tact with said web of paper and means for so movably holding said felt in such contact.

2. In a paper-making machine the combination with a final press roll carrying directly on its surface a web of paper, of a movable transfer felt brought into contact with said web of paper and moved by such contact and means for so movably holding said felt in such contact.

3. In combination with the paper-carrying press roll of a paper-making machine, a movable transfer felt held in contact with the web of paper on said press roll of a paper-making machine, a movable transfer holding said felt in such contact.

4. In a paper-making machine a device for transferring to the first drier a web of paper carried directly on the final press roll consisting of an endless felt coming in contact with the web on said press roll and moving therefrom towards said drier, a roll directly holding said felt in contact with the web on said press roll and other supporting rolls for said felt.

5. In a paper making machine a device for transferring the web of paper from the paper-carrying press roll to the first drier consisting of an endless felt coming in contact with the paper on said press roll and moving therefrom toward said drier, a yieldingly tensioned roll directly holding said felt in contact with the paper on said press roll and other supporting rolls for said felt.

CANADIAN INVESTMENTS TOO HEAVY.

The net earnings of Union Bag & Paper for the fiscal year ended Jan. 31st, 1914, were $534,530, as compared with $554,251, and the balance after charges was $50,082 as compared with $42,993 in the previous, the amount being equal to less than ½ per cent. on the preferred stock in each year.

President Riegal says that while the selling prices on bags showed an improvement during the second half of the year, yet the average selling price on the bulk of the company's product was exceptionally low, due to extreme competitive condition which developed in July, 1912, and continued well into 1913.

Inventories were readjusted by charging off from surplus account $243,423. The total bonded debt and purchase money obligations on Jan. 31st, 1914, were $4,341,333, as compared with $4,907,833 a year previous, making a reduction of $566,500.

This debt was largely incurred through the purchase of Canadian properties which are very valuable and undoubtedly worth considerably more than they cost, but are not self-supporting at present.

The condition of the manufacturing plant is not all that could be desired. About half of the output is made in modern plants and the balance in antiyuated plants. President Riegal estimates that $1,000,000 could be spent on the company's mills but that one-half that sum would make a very marked improvement in the cost of operation.

The policy of the present management is first to attempt to restore the injured credit of the company, following which, unproductive properties must be made productive or sold and certain of the plants must be modernized.

The company must also strengthen itself to meet conditions arising out of the prohibition of pulpwood export from Canada and the recent tariff action of the United States Government.

The present financial condition of the company is that it has in the United States in cash assets approximately $2,000,000, no debts to banks and its total merchandise accounts will not exceed $75,000. In Canada it has cash assets of $1,134,000 and unsecured bank indebtedness of $340,000 which the holders are content to have liquidated by a gradual conversion of inventory.

BATTLE ISLAND AFFAIRS.

(Special to Pulp and Paper Magazine.)

Fulton, N.Y., June 11, 1914.—The schedules of the Battle Island Paper Company on the voluntary bankruptcy proceedings have been filed at Utica by George N. Burt, attorney for the company. The schedules show total liabilities of $1,075,564. Mr. Burt also filed an answer for the Hunter Arms company to the creditors' petition in bankruptcy in which he denies that Post & Pfloto are creditors of the Hunter Arms company. He also denies that the company has committed the acts of bankruptcy alleged. This answer holds up proceedings under the involuntary petition. It does not affect the receivership, but does prevent adjudication.

Of the $1,075,564 liabilities of the Battle Island Paper Company, $610,550 are claims of secured creditors holding first mortgage bonds of the company, which cover all the company's real estate.

To unsecured creditors the company owes $429,813. Of this $35,178 is in notes made by other concerns and discounted by the Battle Island Company at Fulton and Oswego banks.

The assets are placed at $2,941,425. The real estate is valued at $937,000, and debts due to the company are placed at $8,047.

Included in the assets is also a claim against the State for property taken at Fulton for barge canal purposes. This claim is placed at $1,800,000. It has not yet been adjudicated.

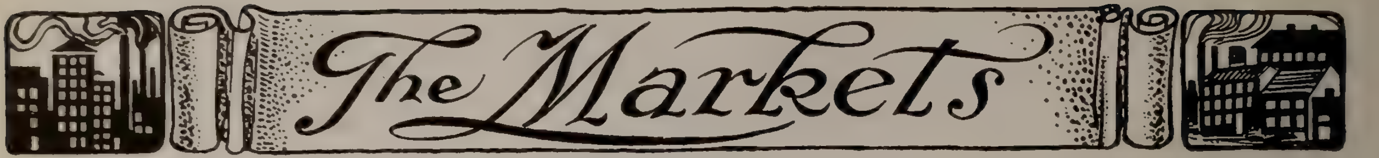
The schedules were authorized by the board of di rectors and signed by F. B. Shepherd as treasurer.

FIRST CAR OF PAPER SHIPPED MAY 27TH

(Special to Pulp and Paper Magazine).

Fort Frances, Ont., June 4th.—W. F. Brooks, of Minneapolis, vice-president of the Ontario and Minnesota Power Company and the Fort Frances Pulp and Paper Co.; also of the Minnesota and Ontario Power Co., and International Lumber Co., of Fort Frances and International Falls, was a visitor in town yesterday. Mr. Brooks said that it was a pleasure to him to see the new paper mill turning out paper and hoped that it would be a benefit to Fort Frances and assist in its growth and progress. Mr. Young said the first shipment of paper from the Fort Frances mill was made on May 27th to the Winnipeg Telegram. In future, said Mr. Young, both the Winnipeg Telegram and Tribune will receive their paper from Fort Frances. The mill is now running nicely and smoothly under the supervision of Supt. Ross, and it is hoped that ere long all the daily papers west of the Great Lakes will be using Fort Frances paper.

The next issue of the Pulp and Paper Magazine will contain accounts of the development of building operations in one or two of the leading mills in the country.



The Markets

CANADIAN MARKETS

The general conditions continue fair and news print keeps up well in price and demand. Instead of the market being overdone by recent increased tonnage, there seems to be a ready sale for all that is presented to the trade. In fact, one Canadian plant is so busy with orders for news print that it has withdrawn all quotations. Book and writing mills appear to be fairly well employed and the whole outlook for summer trade is more encouraging than it was some time ago; the production will not be anything like last season. Orders are much smaller and in weight and finish differ very widely. Wrapping paper mills are quiet. Business in this line and in glazed and unglazed krafts is badly cut in the matter of prices. Ground wood and chemical pulp mills are moderately active, but are anticipating much better business in the next few weeks owing to the low water on the other side of the line. Water conditions in Canada are not very encouraging and all the streams are low, but the state of affairs is much better than across the border. The rag and paper stock market is dull and no immediate improvement is looked for.

Following are the quotations f.o.b. Toronto:—

Paper.

News (rolls), $1.90 to $2 at mill, in carload lots.
News (sheet), $2.05 to $2.20 at mill, in carload lots.
News (sheet), $2.25 to $2.50, depending on quantity.
Book papers (carload), No. 3, 3.75c. to 4.25c.
Book papers (ton lots), No. 3, 4c. to 5.50c.
Book papers (carload), No. 2, 4.25c.
Book papers (ton lots), No. 2, 4.50c. to 5.25c.
Book papers (carload), $4.75 to $5.25.
Book papers (ton lots), No. 1, 5.25c. to 6.00c.
Writings, 5c. to 7½c.
Sulphite bond, 6½c. to 7½c.
Grey Browns, $2.25 to $2.75.
Fibre, $3.00 to $3.75.
Manila, B., $2.50 to $3.00.
Manila, No. 2, $2.85 to $3.50.
Manila, No. 1, $3.25 to $4.00.
Unglazed Kraft, $3.75 to $4.50.
Glazed Kraft, $3.75 to $4.75.

Pulp.

Ground wood (at mill), $15 to $16.
Ground Wood, $21 to $24, delivered in United States.
Sulphite (unbleached), $41 to $43, delivered in Canada.
Sulphite (unbleached), $42 to $44, delivered in United States.
Sulphite (unbleached), $55 to $58, delivered in Canada.
Sulphite (bleached), $56 to $58, delivered in United States.

Paper Stock.

No. 1 hard shavings, $1.87½ to $1.90, f.o.b., Toronto.
No. 1 soft white shavings, $1.75.
No. 1 mixed shavings, 45c.
White blanks, 87½c to 90c.
Heavy ledger stock, $1.40 to $1.45.
Ordinary ledger stock, $1.10.
No. 2 book stock, 45c to 50c.
No. 1 book stock, 70c.
No. 1 Manilla envelope cuttings, $1.10 to $1.15.
No. 1 print Manillas, 60c.
Folded news, 45c.
Over issues, 50c.
No. 1 clean mixed paper, 25c to 27½c.
Old white cotton, $2.50 to $2.75.
Thirds and blues, $1.30 to $1.32½.
No. 1 white shirt cuttings, $5.00.
Black overall cuttings, $1.75.
Black linings, $1.75.
New light flannelettes, $4.75.
Ordinary satinets, 80c.
Flock, 85c.
Tailor Rags, 70c.

Quotations f.o.b. Montreal are:—

Book and News Paper.

Roll News, $40 to $43 per ton for large orders; $45 to $50 per ton for small orders.
Ream News, $45 to $47 per ton for large orders; $50 to $60 per ton for small orders.
No. 1 Book, 5¼c to 6c per lb.
No. 2 Book, S.C., $4.50 to $4.75 in large quantities; $4.75 to $5.50 in small quantities.
No. 3 Book, M.F., $4.00 to $4.25 in large quantities; $4.40 to $4.50 in small quantities.
Writings, 5c to 7½c.
Sulphite Bond, 6½c to 8½c.

Wrappings.

Grey Brown, per 100 lbs., car lots, $2.25 net; 5 tons $2.45; 2 tons, $2.55; 1 ton, $2.65; less, $2.75.
Red Brown, car lots, $2.85; 5 tons, $2.95; 2 tons, $3.05; 1 ton, 3.15; less, $3.25.
B. Manilla, car lots, $2.85; 5 tons, $2.95; 2 tons, $3.05; 1 ton, $3.15; less, $3.25.
No. 2 Manilla, car lots, 3.10; 5 tons, $3.20; 2 tons, $3.30; 1 ton, $3.40; less, $3.50.
No. 1 Manilla, car lots, $3.25; 5 tons, $3.45; 2 tons, $3.55; 1 ton, $3.65; less $3.75.
Kraft, $3.75 to $5.00.
Fibre, car lots, $3.25; 5 tons, $3.45; 2 tons, $3.55; 1 ton $3.65; less $3.75.
Fibre, $2.75 to $3.50.
Manila, B., $2.50 to $3.25.

On large orders to the jobbing trade some manufacturers are quoting 10 to 25 per cent below the above prices on wrapping.

Pulp.

Sulphite easy bleaching, $43 to $45 per ton.
News quality, $41 to $42 per ton.
Bleached sulphite, $54 to $59 per ton.
Kraft pulp, $3.60 to $4.00.
Ground wood, No. 1, $15 to $16.
Ground wood, No. 2, $22 to $24, delivered United States.

FELT MILL BURNED.

The plant of the Lachute Knitting Mills, Lachute, Que., manufacturers of felt, was burned to the ground on Friday, June 5th, entailing a loss of $40,000.

NEW YORK MARKETS.

Office, Pulp and Paper Magazine,
206 Broadway, New York,
June 13th, 1914.

The situation in ground wood has materially strengthened during the interval. An early dry season brought about a shortage of water at certain paper mills which had to come into the market for ground wood pulp. These mills paid an average price of more than $16 at the mill. The lowest price paid for fresh pulp was a contract order for 3,000 tons at $15.88 at the mill. No. 2 pulp, which consists of storage piles that have been standing anywhere from two months to more than two years, has brought an exceptionally good price, the lowest being $15.08 at the mill. Local grinders are very confident of the future and regard this year very favorably. The heavy consumption of ground wood has been largely attributed to the good demand for news print.

The chemical fibre markets are essentially unchanged except that certain paper mills are forcing the price in spot orders down. Certain importers who bought on speculation have had some cause to regret it as they have lost money on their deals. Some shipments of unbleached sulphite have been made at $1.94 delivered with a 16-cent freight rate. No contracts have been made as yet.

Rags and bagging are in poor demand and prices are weak. Shippers have been holding roofing stock in preference to making deliveries until satisfactory arrangements have been made with paper manufacturers.

The old waste paper market has been somewhat quiet owing to the easing in the demand for book papers and boxboards. Soft white showings are commanding 1.80c to 1.90c, and the higher grades of hard shavings are quoted at 2.35c to 2.45c. Flat stock is in fair demand and its grades are quoted as follows:—Heavy stitchless, 95c to 1.05c; magazine 90c to 95c; crumpled 75c to 80c. Box board chips are now ranging from 35c to 40c, although mills are offering as low as 32½c. The condition of old newspapers is essentially unchanged. Old mixed papers are in rather poor demand, and the price of 27½c to 32½c is rather weak. Common paper has been sold in the local market as low as 20c, although the market value seems to be about 22½c to 27½c a hundred pounds.

Pulp.

Ground Wood, No. 1, $20 to $24, delivered.
Ground Wood, No. 2, $15 to $17, delivered.
Unbleached sulphite, dom., 1.90c to 2.20c, delivered.
Unbleached sulphite, imptd., 1.85c to 2c., ex. dock, New York.
Bleached sulphite, domestic, 2.80c. to 3c., delivered.
Bleached sulphite, imptd., 2.60c. to 2.90c. ex. dock, New York.
Easy Bleaching, imptd., 2c to 2.15c ex. dock, New York.
Unbleached sulphate, imptd., 1.75c to 2c., ex. dock, New York.
Bleached sulphate, imptd., 2.50c to 2.75c., ex. dock, New York.
Kraft Pulp, 1.75c to 1.85c, ex. dock, New York.

The improved condition of the financial market of New York has restored considerable confidence in business interests, and the result has been a somewhat healthier tone to business in general. There has been a good deal of pessimistic talk regarding the acts of the government in its treatment of the large corporations and also a good deal of talk attributes the business depression to the tariff and the Mexican situation. Local factors who have travelled considerably both in this country and Europe report that the condition is not local, but international. It is the opinion of one factor that the trouble is not with the administration, in which he has great confidence, but rather to the waste and expense caused by the Balkan war, which has kept investors from placing their money in new projects. The lack of development in South America is due to a need of capital, which cannot be obtained on account of the tying up of large sums in the financing of that disastrous war. As the usual quiet season is now on for the paper business, there is little demand and the market reflects a quiet tone. The heavy consumption of newsprint shows little easing although most of it is not due to heavy advertising, but to the imprinting and heavy editions. The prevailing opinion is that newsprint will advance in price before the end of the summer. Reports from all over the country show that stocks are very low among jobbers, and consumers of all grades of paper. Book is in poor demand as this is the quietest time of the year for this grade. Prices are firm, however. Wrappings and manilla papers are in quiet demand and values are inclined to be weak. The value of boards is rather on the decline under slight consumption and poor demand. The specialty business still maintains a good demand and fair values. Paper towels and toilet papers are in good demand at firm prices. The tissue market is weak and quiet, and it is reported that some mills have shut down. Paper bags are in poor demand but values are firm. The best demand for writings is in the cheaper grades.

Quotations.

News, rolls, transient business, $1.95 to $2.05 f.o.b.
News, rolls, contract renewals, $1.95 to $2.00 f.o.b.
News, side runs, $2 to $2.10 f.o.b. mill.
News, sheet, $2.25 to $2.30 f.o.b. mill.
Book papers, car lots, M.F.S., $3.75 to $3.90 f.o.b.
Writing paper, superfine, 13½c. to 17c., del. east of Miss. River.
Writing paper, extra fine, 11c., del. east of the Miss. River.
Writing paper No. 1, fine, 9c., del, east of the Miss. River.
Writing paper, No. 2, fine, 8c., del. east of the Miss. River.
Writing paper, engine sized, 4½c. to 8c., del. east of the Miss. River.
Bond paper, 5c. to 24c., delivered east of Mississippi River.
Ledger paper, 8c. to 30c., delivered east of Mississippi
Linen paper, 7c. to 18c., delivered east of Mississippi River.
Manila jute, 4¾c. to 5½c., delivered.
Manila, wood, $2.40 to $3.00, delivered.
Kraft, No. 1, $3.50 to $3.75 f.o.b. mill.
Kraft, No. 2, $3.25 to $3.50, f.o.b. mill.
Boxboards, news, $28 to $30 per ton, delivered.
Boxboards, chip, $26 to $28 per ton, delivered.
Boxboards, straw, $27 to $29 per ton, delivered.
Wood pulp board, $42.50 to $45 per ton, delivered.
Tissue, white, cylinder, 40c. to 42½c., delivered.
Tissue, fourdrinrie, 47½c. to 50c., delivered.
Tissue, jute Manila, 40c. to 41½c., delivered.

THE BRITISH MARKETS.

(Special to Pulp and Paper Magazine.)
London, June 3, 1914.

There is very little improvement to report in the state of the British paper industry. Since the beginning of the year business has been in a dull state, but manufacturers continue to be optimistic, while the paper agents are complaining bitterly over the small profits they are turning over compared with this time last year. On export account particularly is the dullness of trade felt in all qualities of papers and boards, but in the home trade there are just sufficient orders on hand to keep mills running at a steady capacity and no more. There is a fair demand for fine printing papers and good grades of news print, but packing and wrapping papers are dull and only the cheap foreign products from Sweden and Germany and Norway are finding any sort of an outlet in the market. Envelope papers are in demand. Paper hangings are slow in moving, both in the domestic and foreign markets, which appears somewhat singular, as at this period of the year there is usually plenty of orders on mill books. British manufacturers are not bashful now in stating that trade recently has been greatly against them and in some mills short time has been resorted to. Reports from the continent also show that the paper industry is passing through a dull period and that makers of all classes of papers could do with a larger number of orders than they are experiencing at present. In Scandinavia there is a good deal of uneasiness over slowness of new business.

* * * *

Large consignments of mechanical pulp are now reaching England under contracts, and enquiries have recently been numerous regarding new contracts, the dullness of the paper trade no doubt being taken advantage of with a view to knocking down current quotations. At present mechanical is somewhat quiet and prices are unchanged. Contracts extending over three and four years have been entered into. This is one of the great tendencies now in England and efforts have recently been made to make the periods of contracts extend up to five years, a fact which Canadians might not lose sight of. The prices of these contracts are stated to be satisfactory from the producer's point of view. Prices are now about as follows, c.i.f. British ports:—

Pine, 50 per cent., unwrapped (prompt), $9.60 to $10.
Pine, dry (prompt), $20 to $23.

For forward delivery charge about half a dollar extra.

* * * *

The enquiries for sulphite and sulphate are numerous, but not much business is passing notwithstanding signs of weakness in prices. Strong sulphite has recovered itself slightly, but easy bleaching sulphite is inclined to continue weak. There is no activity in soda paper, but there is a slight improvement in easy bleaching. Reports from Scandinavia show that mills have still fair stocks on hand and complaints are frequent about the dearth of new business being transacted. Prices are about as follows, c.i.f. British ports:

Bleached Sulphite (No. 1), $55.80 to $60.
Easy bleaching sulphite, $41.40 to $45.
Sulphite news, $36.60 to $41.40.
Unbleached soda, $36.50 to $36.70.
Soda kraft, $31.80 to $36.

Trade in rags is good and prices are unchanged, and are likely to continue so for some time. Esparto is steady, but, of course, considerably dearer than it was this time last year; neither do the arrivals of supplies since January come up to those of last year. Shippers are, therefore, not pressing for offers. Rosin is quiet for sometime past and sizing shows signs of hardening in prices.

* * * *

The chemical markets in Liverpool, Manchester and London are extremely quiet, but prices show no change. Bleaching powder is quoted at $24.50; caustic soda $48 for 70-76 per cent.; salt cake $9.60; and soda crystals $9.80. The demand for china clay has somewhat fallen and there is talk of prices also coming very slightly. However, an increased demand would at once harden prices again.

REASONS FOR FREIGHT RATE DECISIONS.

(Special to Pulp and Paper Magazine.)

Dayton, O., June 10, 1914.—Local news consumers were interested in the announcement the past week of the Interstate Commerce Commission of the reduction of rates on news print paper from Sault Ste. Marie, Canada, to Dayton, Cincinnati, and other Ohio points, also to points in adjoining states. According to the plan, the rates from the Soo to points in Ohio must be placed on a parity with existing rates from the group of Fox River mills in Wisconsin to the same destination of 1.7 cents a hundred.

The Commission appears to have found that the average distance from the mills in the Fox River group to Ohio destinations was 11 miles greater than from the Soo, but that the average rate was 1.7 cents less. On account of this the commission held that a reduction to the basis of the Fox River rates would be reasonable.

The present rate from the Soo to the Ohio destintions is 17.7 cents. No reparation to Ohio buyers is ordered, although the Commission held that reparation should be granted on shipments between the Soo and Chicago.

The points in Ohio to which the reduction is made are Dayton, Cincinnati, Portsmouth, Marietta, Youngstown, Cleveland, Toledo, Akron, Springfield, Columbus, and Canton. The reduction also extends to Pittsburg, Pa.

The decision was rendered in the case of the Lake Superior Paper Company against the Duluth, South Shore and Atlantic Railroad and others. The Lake Superior Company has a large pulp and paper mill at Sault Ste. Marie, Ont., with general offices in this city. H. E. Talbot, of this city, is the president of the company and George Mead, of Chillicothe and Dayton, is also a prominent officer. All local interests appeared to have been pleased with the decision. The News League of Ohio, with publications in this city and Springfield, are heavy consumers of Soo news print, and the decision was of direct interest to many daily newspapers and weeklies in the state.

ABITIBI'S PROGRESS.

President Anson of the Abitibi Power and Paper Company, is a busy man these days. The new ground wood plant at Iroquois Falls will be in operation on June 15th. The company has been advertising for grinder men, wet machine men and barker men and have received many applications from all over Canada. Ultimately the plant will have a capacity of 225 tons daily.

PULP AND PAPER NEWS

The pulp and paper mills in Queens County, Nova Scotia, owned by Frank Stanfield, have just been sold to a syndicate.

The Shawinigan Water & Power Company, Power Building, Craig Street, Montreal, P.Q., are contemplating the purchase of 800 thirty-foot cedar poles, to be delivered within the next three months.

The Dunlop Pulp & Paper Mills, Limited, has been incorporated with head office at Selkirk, Man., and capital of $1,000,000. Among those interested are F. A. Dunlop, 316½ Donald Street, and T. McHattie, 846 Main Street. The company is given power to buy, sell and manufacture pulp and paper.

Mr. Duncan Chisholm, representing the Chisholm Corporations, Limited, has entered into an agreement with the Ontario Government for the purchase of the pulp wood on the Metagami River pulp limit. Tenders for this limit were received until December 31st last, but none of the offers were acted upon at the time because certain conditions were not considered satisfactory to the government. One of the conditions of the tender is that the company shall instal a pulp mill costing not less than $250,000 to handle seventy-five tons of pulp per day and employ not less than 200 hands on an average of ten months in the year. Crown timber dues of 40 cents per cord for spruce and 20 cents per cord for other woods are to be imposed, the Crown reserving a railway right-of-way, water powers, and granted lands.

Mr. Justice Morrison of the Supreme Court of British Columbia has confirmed the contract between the Western Canada Trust Company as receivers for the debentures-holders of the Ocean Falls Company and Messrs. Fleishhacker Bros. and Johnston, of San Francisco, by which the large plant of the Ocean Falls Company, situated 200 miles north of Vancouver is to pass under the control of a merger of the Pacific Coast Pulp and Paper interests. The contract is reported to have been endorsed by the debenture-holders at a recent meeting in London, England. The plant is one of the largest on the coast and is equipped with modern machinery for producing 140 tons of dry pulp per day. The sawmill in connection with the plant has been in active operation for some time. It is expected that the pulp plant will be again in operation in the near future. The Fleishhacker interests already control a large pulp mill on Quatsino Sound and another on Howe Sound, together with other pulp mills at various points on Puget Sound.

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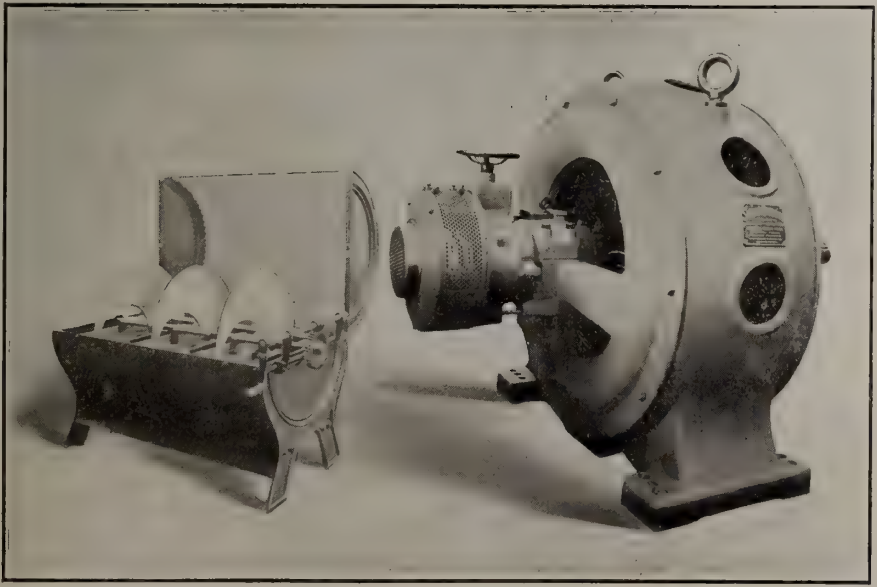

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SOLE AGENTS FOR UNITED STATES & CANADA

CORRECTION IN ARTICLE ON MANUFACTURE OF SULPHITE WOOD PULP (June 1st Issue.)

Page 263, under "Preparation of acid," on line 3
Reads $[(\text{Ca Mg})\ (H_2SO_3)_2 + 2\text{—}H_2SO_3 + NH_2O$.
Should be: $|(\text{Ca Mg})\ (H_2SO_3)_2 + 2 < H_2SO_3 + nH_2O$.
($2 < H_2SO_3 = 2$ or more molecules of H_2O_3 and nH_2O=indefinite number of molecules of H_2O.)
Page 294, Col. 2, Line 16 from the bottom—
Reads: "To every 6 lbs of this burnt of metal——"
Should be: "To every 60 lbs of this burnt metal——"

TIMBER LIMITS IMPERILLED.

Blind River, Ont., June 2.—For the past ten days there has been great anxiety felt by the residents of Blind River as to the outcome of the forest fires which have been general in this district. The government had placed again for sale the limits withdrawn by them last March. As the greater part of the timber on these limits consists of trees blown down in the great storm of November 9th last, the fear of the fire destroying them would seriously impair the activity of business prospects in the Blind River district, and interfere with the forthcoming government sale on July 6th next. The rainfall, therefore, was welcomed greatly.

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CHAIN
BLOCKS

THE MEN LIKE THEM.

THE HERBERT MORRIS CRANE
& HOIST COMPANY, Limited
EMPRESS WORKS, Peter Street, TORONTO.

AUCTION SALE OF TIMBER LIMITS

Re:- H. M. PRICE & CO.

Lumber Merchants, Quebec, Insolvent.

PUBLIC NOTICE is hereby given that on WEDNESDAY, August 5th, 1914, at 10 o'clock A.M., the Timber Limits hereinafter mentioned will be offered for sale by Auction without reserve, at the office of Messrs. LaRue & Trudel, Accountants, Dominion Building, 126 St. Peter Street, Quebec:—

			Sq. Miles.
License No.	181	River St. Jean Br. East No. 1	22
” ”	182	River St. Jean N.E. Branch No. 2	18
” ”	183	River St. Jean East Branch No. 3	20
” ”	184	River St. Jean, No. 7	12
” ”	185	River St. Jean, No. 8	12
” ”	186	River Saumon & Tribut River St. Jean	34
” ”	187	River Magpie, No. 3	32
” ”	188	River Magpie, No. 4	32
” ”	189	River Magpie, No. 5	32
” ”	190	River Magpie, No. 6	32
” ”	191	River Magpie, No. 7	32
” ”	192	River Magpie, No. 8	32
” ”	193	River St. Jean, No. 1	24
” ”	193	River St. Jean, No. 2	24
” ”	194	River St. Jean, No. 3	23
” ”	195	River St. Jean, No. 4	18
” ”	196	River St. Jean, No. 5	20
” ”	197	River St. Jean, No. 6	20
” ”	198	River Magpie, No. 1	32
” ”	199	River Chambers, No. 1	56

A total of 527 square miles more or less. Also a certain area of freehold land to be used as a mill site and fully described in deeds in the hands of the undersigned curators.

Conditions of Sale:—Ten per centum cash on adjudication, the balance payable upon transfer of the licenses, which transfers will have to be made at once, the transfer fee to be payable by the purchasers.

The purchaser will pay in addition to the purchase price, the auction duty of one per cent and will accept the licenses as they are without any responsibility on the part of the estate as to the condition, area or quality of the limits.

For inspection of the licenses and other particulars please apply to the undersigned:—

A. F. C. ROSS (Messrs. P. S. Ross & Sons),
142 Notre Dame St. West, Montreal.
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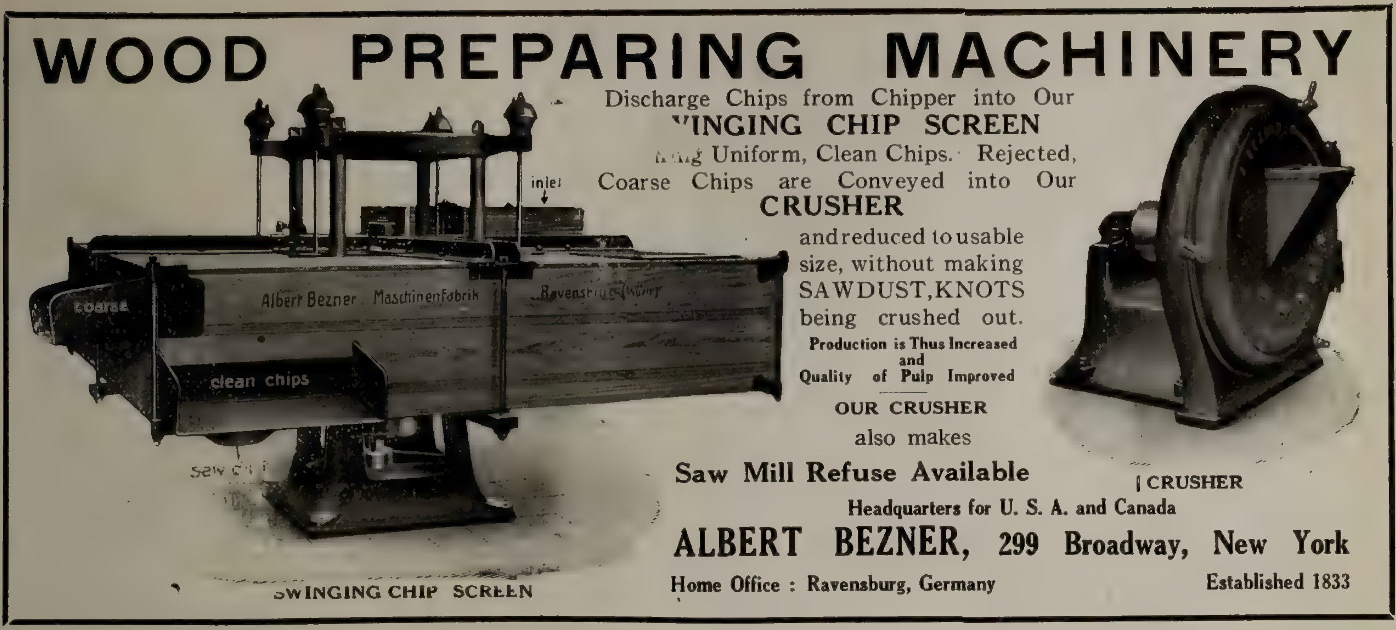

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TENDERS FOR WOOD LIMIT.

TENDERS will be received by the undersigned up to and including Monday the 8th day of June, 1914, for the right to cut wood of various descriptions on a certain area tributary to the Frederickhouse and Abitibi Rivers in the District of Temiskaming.

Tenderers shall state the amount they are prepared to pay as bonus in addition to the ordinary Crown dues, including 40c per cord for Spruce and 20c per cord for other pulpwoods, or such other rates as may from time to time be fixed by the Lieutenant-Governor in Council for the right to operate wood products mills on or near the area referred to.

Such tenderers shall be required to erect a mill or mills on or near the territory, and to manufacture the wood into products thereof in the Province of Ontario.

Parties making tender will be required to deposit with their tender a marked cheque payable to the Honourable the Treasurer of the Province of Ontario for ten per cent. of the amount of their tender, to be forfeited in the event of their not entering into an agreement to carry out the conditions, etc.

The highest or any tender not necessarily accepted.

For particulars as to description of territory, capital to be invested, etc., apply to the undersigned.

W. H. HEARST,
Minster of Lands, Forests and Mines.
Toronto, Ontario, 24th April, 1914.

TENDERS FOR ALLAN WATER RIVER WOOD LIMIT.

TENDERS will be received by the undersigned up to and including Wednesday, the 15th of July next for the right to cut ties from Spruce, Balsam, Banksian or Jack Pine, Poplar and Whitewood trees seven inches and upward in diameter two feet from the ground sufficient to supply a tie preserving plant for a period of twenty-one years from unoccupied, unsold and unlocated lands of the Crown tributary to what is known as the Allan Water River, tributary to the Grand Trunk Pacific Railway in the District of Thunder Bay.

Tenders shall state the amount they are prepared to pay as bonus in addition to the crown dues of $2 per thousand feet board measure for anything not manufactured into ties, and for ties at the rate of 5c each, or such other rates as may from time to time be fixed by the Lieutenant-Governor in Council.

Such tenderers shall be required to erect within the limits of the territory covered by the right to cut ties, or at some other place approved by the Lieutenant-Governor in Council a tie preserving plant.

Parties making tender will be required to deposit with their tender a marked cheque payable to the Honourable the Treasurer of the Province of Ontario for $25,000.00, to remain on deposit as security for the carrying out of the conditions of their tender.

The highest or any tender not necessarily accepted.

For particulars as to description of territory, capital to be invested, etc., apply to the undersigned.

W. H. HEARST,
Minister of Lands, Forests and Mines.
Toronto, Ontario, 27th April, 1914.

SALE OF PINE TIMBER ON METAGAMI INDIAN RESERVE.

TENDERS will be received by the undersigned up to and including the 6th July next for the right to cut the Red, White and Jackpine timber over eight inches in diameter on the Metagami Indian Reserve, situate on the Metagami River in the District of Sudbury.

For particulars, descriptions, conditions, etc., apply to the undersigned.

W. H. HEARST,
Minister of Lands, Forests and Mines.
Department of Lands, Forests and Mines,
Toronto, 2nd May, 1914.

No unauthorized publication of this notice will be paid for.

TIMBER SALE.

TENDERS will be received by the undersigned up to noon of the 15th day of July, 1914, for the right to cut the Red and White Pine timber on berths 1, 2 and 3, Township of Blyth, in the District of Nipissing.

For maps and conditions of sale apply to the undersigned, or the Crown Timber Agents at Sudbury and North Bay.

W. H. HEARST,
Minister of Lands, Forests and Mines.
Toronto, May 4th, 1914.

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Timber Concessions in the Province of Quebec

Notice is given by the Government of the Province of Quebec, that, on the 11th of August, and on the 20th of October, 1914, permits to cut timber on over 8,000 square miles of Crown Lands will be offered at public auction.

The territory to be disposed of comprises some 1,200 square miles in the basins of rivers Ottawa, Harricana and Bell, in the Abbitibi region; 6,000 square miles in the Lake St. John northern region; 350 square miles in the Lake St. John East agency; 242 square miles in the Matapedia division.

On the first date above mentioned, permits will be offered at ordinary conditions on some 3,000 square miles.

The timber grants advertized for the 20th of October, comprising the basins of three large rivers in the Lake St. John region, with considerable water powers, will be subject to the obligation of manufacturing the wood into pulp or paper within the province of Quebec.

For particulars, please apply to the Department of Lands and Forests, Quebec, Canada.

ELZ. UIVILLE DECHENE,

Deputy-Minister of Lands & Forests.

Quebec, 11th April, 1914.

TIMBER SALE

TENDERS will be received by the undersigned up to noon of the 6th day of July, 1914, for the right to cut the Red and White Pine timber on Berths 1 B, 1 C, and 1 D, in the Mississaga Forest Reserve tributary to the north shore of Lake Huron, each Berth containing an area of 36 square miles, more or less.

For maps and conditions of sale apply to the undersigned or the Crown Timber Agents at Thessalon, Sault Ste. Marie, Webbwood and Sudbury.

W. H. HEARST,

Minister of Lands, Forests and Mines, Toronto, April 18th, 1914.

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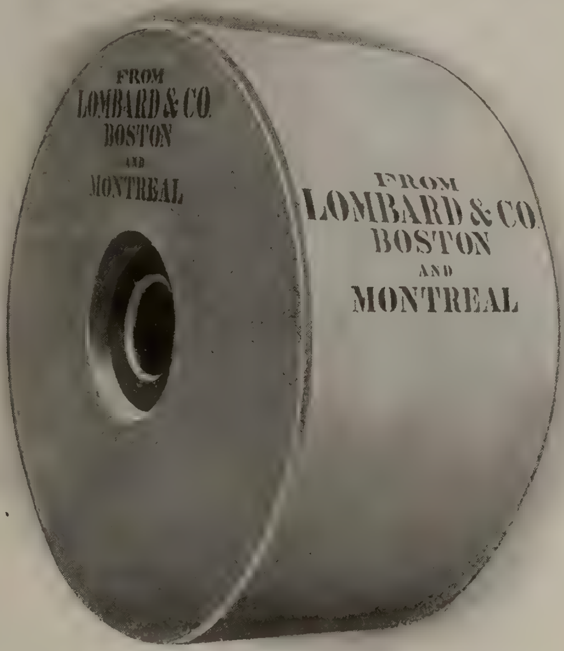

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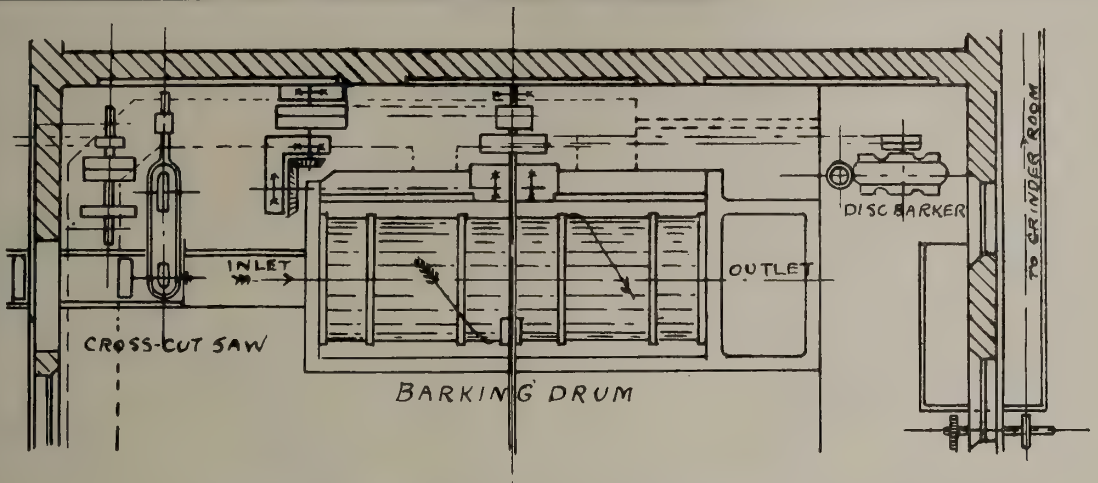

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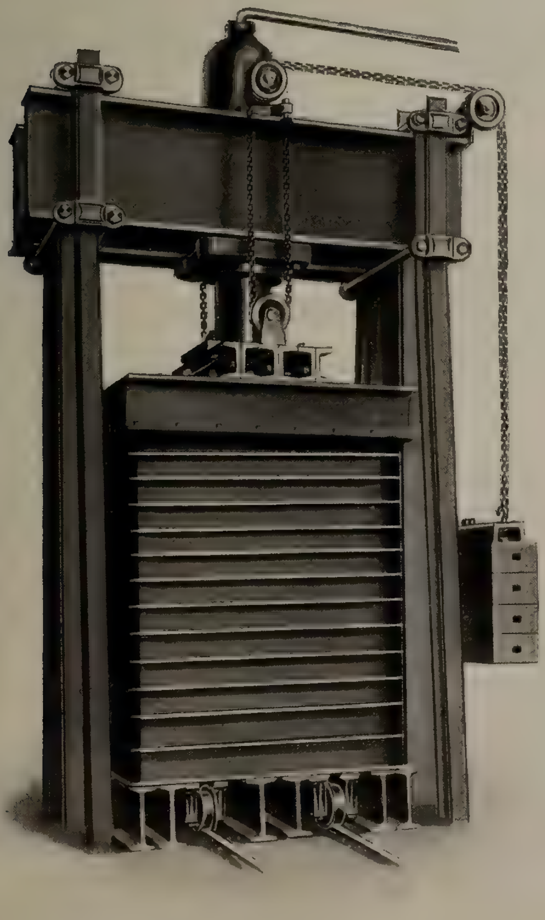

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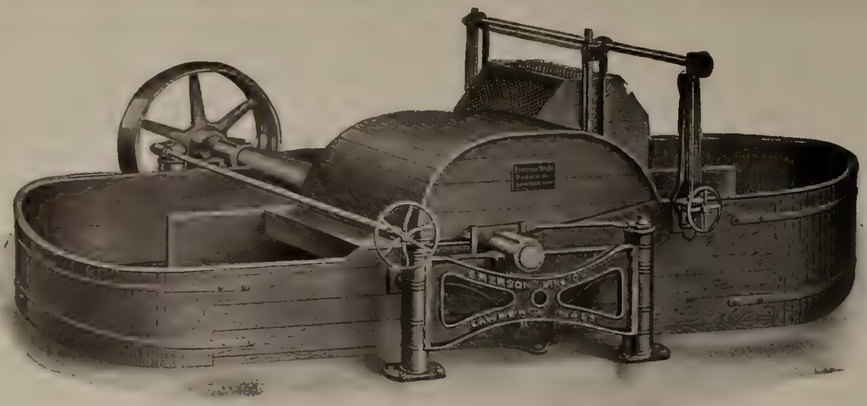

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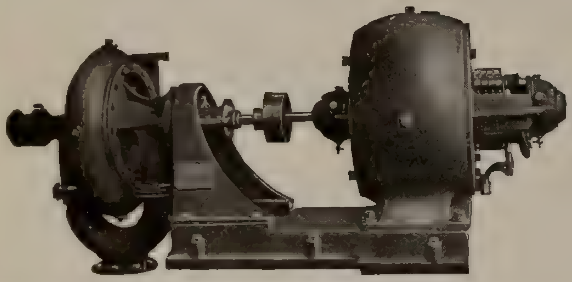

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Capital Wire Cloth and Manufacturing Co. Ltd., Ottawa, Ont
Chambers Ltd., 152 Bay Street, Toronto.
Johnson & Sons, C. H., St. Henry, Montreal, Can.
Marshall, T. J. & Co., Ltd., London, Eng.
Digester Lining
Boving & Co., of Canada, Limited, Toronto, Ont.
Panzl Digester Lining Co., Muskegon, Mich.
Preston's Digester Lining Co., Radcliffe, Eng.
Process Engineers, Ltd., Montreal, Can.
Stebbins Eng. & Mfg. Co., Watertown, N.Y.
Digesters
Boving & Co., of Canada, Limited, Toronto, Ont.
Jensen og Dahl, J. & A., 1 Broadway, New York City.
Digester Gauges
Schaeffer & Budenberg, Brooklyn, N.Y.
Drainer Bottoms
Snell, Samuel, Co., Holyoke, Mass.
Dryers
Bertram Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Electric Cranes
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Elevating and Conveying Machinery
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Evaporators
Boving & Co., of Canada, Limited, Toronto, Ont.
Process Engineers, Ltd., Montreal, Canada.
Scott, Ernest & Co., Fall River, Mass.
Exhausters
The Sherbrooke Machinery Co., Sherbrooke, Que.
Experimental Machinery
Chambers Ltd., 152 Bay Street, Toronto.
Marshall, T. J. & Co., Ltd., London, Eng.
Process Enginners Ltd., Montreal, Can.
Exporters
Parsons Trading Co., New Tork, N.Y.
Felts
Ayers, Ltd., Lachute Mills, Que.
Bates & Innes, Ltd., Carleton Place, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Heimbach, Thos. Jos., Ltd., Duren, Germany.
Huyck, F. C., Albany, N.Y.
Johnson, C. H. & Sons, St. Henry, Montreal, Can.
Penmans, Ltd., St. Hyacinthe, Can.
Porritt, Joseph & Sons, Manchester, Eng.
Spencer, J. H. & Sons, Bury, England.
Tippett Arthur P. & Co., Montreal, Can.
Filters
Boving & Co., of Canada, Limited, Toronto, Ont
Chambers Ltd., 152 Bay Street, Toronto.
Norwood Engineering Co. of Canada, Ltd., Cowansville, P.Q
Friction Hoists
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Gauges
Schaeffer & Budenberg, Brooklyn, N.Y.
Generators and Transformers
Chambers Ltd., 152 Bay Street, Toronto.
Siemens Co., of Canada, Ltd., Montreal, Can.
Governers for Electrical Driven Grinders
Jensen og Dahl, J. & A., 1 Broadway, New York City.
Governers for Water Driven Grinders
Jensen og Dahl, J. & A., 1 Broadway, New York City.
Gravity Lowering Blocks
Morris, Herbert, Crane & Hoist Co., Toronto, Ont
Grinders
Boving & Co, of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage. N.Y.
Glens Falls Mach. Works, Glens Falls, N.Y.
Hamilton, Wm., Co., Peterboro, Can.
Jenckes Machine Co., Sherbrooke, Que.
Voith, J. M. Co., Inc., New York, N.Y.
Voith, J. M., Wurtemberg, Germany.
Waterous Engine Works Co. Ltd., Brantford, On

MILL SUPPLIES---Continued

Heating
Sheldons, Ltd., Galt, Ont
Hoists.
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Northern Crane Works Limited, Walkerville, Ont
Hoists—Chain Electric and Pneumatic
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Jordan Engines
Boving & Co., of Canada, Limited, Toronto, Ont
Jones, E. D. & Co., Pittsfield, Mass.
Process Engineers, Ltd., Montreal, Canada.
Knives
Boving & Co., of Canada, Limited, Toronto, Ont
Chambers Ltd., 152 Bay Street, Toronto.
Crookes, Roberts & Co., Sheffield, Eng.
Hay, Peter, Knife Co., Galt, Can.
Tippet, A. P. & Co., Montreal, Can.
Kollergangs
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont
Chambers Ltd., 152 Bay Street, Toronto.
Laying Machines
Chambers, Ltd., Toronto.
Collis & Sons, J, London, Eng.
Motor
Chambers Ltd., 152 Bay Street, Toronto.
Siemens Co. of Canada, Ltd., Montreal, Can.
Presses
Boving & Co., of Canada, Limited, Toronto, Ont.
Can. Boomer & Boschert Press Co., Montreal, Can.
Chambers Ltd., 152 Bay Street, Toronto.
Paper Stock, Etc.
Hough, R., London, England.
Pullan, E., 490 Adelaide Street, W., Toronto, Can.
Walker, J. R., & Co., 35 Common Street, Montreal, Can.
Paper and Pulp Machinery
Beloit Iron Works, Beloit, Wis.
Bentley & Jackson, Bury, England.
Bertram, James & Son, Ltd., Edinburgh, Scotland.
Bertram's, Ltd., Edinburgh, Scotland.
Black-Clawson Co., Hamilton, Ohio.
Canadian Boomer & Boschert Press Co., Ltd., Montreal.
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Chambers Ltd., 152 Bay Street, Toronto, Can.
Dillon Machine Co., Lawrence, Mass.
Emerson Mfg. Co., Lawrence, Mass.
Farrell Foundry & Mach. Co., Ansonia, Conn.
Fullner, H., Warmbrunn, Germany.
Glens Falls Machine Works, Glens Falls, N.Y.
Green Bay Barker Co., Green Bay, Wis.
Hamilton, Wm., Co., Peterboro, Can.
Harmon Machine Co., Watertown, N.Y.
Jenckes Machine Co., Sherbrooke, Que.
Jensen og Dahl, J. & A., 1 Broadway, New York City.
Jones, E. D. & Sons Co., Pittsfield, Mass.
Johnson, C. H. & Sons, Ltd., Montreal, Can.
Marx, J. & Co. London, E.C., England.
Moore & White Co., Philadelphia, Pa.
Process Engineers, Ltd, Montreal, Canada.
Pusey-Jones Co., Wilmington. Del.
Rice, Barton & Fales Worcester, Mass.
Sandy Hill Iron & Brass Works, Hudson Falls, N.Y
Scott, Ernest & Co., Fall River, Mass.
Sheldons, Ltd., Galt, Can.
Sherbrooke Mach. Co., Ltd., Sherbrooke, Can.
Smith, S. Morgan, Co., York, Pa
Stebbins Eng. & Mfg. Co., Watertown, N.Y.
Ticonderoga Machine Works, Ticonderoga, N.Y.
Valley Iron Works, Appleton, Wis.
Voith, J. M., New York, N.Y.
Voith, J. M., Wurtemberg, Germany.
Walmsley, Chas. & Co., Bury, Eng.
Waterous Engine Works Co., Ltd., Brantford, Can.
Westbye, P. P., Peterboro, Can.
Paper Machine Tachomoters
Boving & Co., of Canada, Limited, Toronto, Ont.
Schaeffer & Budenberg, Brooklyn, N.Y.
Paper Tester
Chambers Ltd., 152 Bay Street, Toronto.
Marshall, T. J. & Co., Stoke Newington, London, England.
Pneumatic Thickeners
Sherbrooke Mach. Co., Ltd, Sherbrooke, Que.
Pneumatic Chain Blocks
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Press Rolls
Bertrams Ltd., Edinburgh, Scotland.
Chambers Ltd., 152 Bay Street, Toronto.
Process Engineers Limited, Montreal, Can.
Sherbroke Mach. Co Ltd, Sherbroke, Que.
Press Wire Cloth.
Chambers Ltd., 152 Bay Street, Toronto.
Kufferath, Andreas, Mariaweiler, Germany.
Pulp Stones
Lombard & Co., Boston, Mass.
Stancliffe Estates Co., Ltd., Darley Dale, England.
Pumps
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Dillon Machine Co., Lawrence, Mass.
Glen Falls Machine Works, Glens Falls, N.Y.
Hamilton, Wm., Co., Peterboro, Can.
Lawrence Machine Co., Lawrence, Mass.
Lawrence Pump & Engine Co., Lawrence. Mass.
Smart-Turner Machine Co., Hamilton, Can.
Sherbrooke Mach Co., Ltd. Sherbrooke, Que.
Voith, J. M., New York, N.Y.
Rags
Walker, J. R. & Co., Montreal, Can
Recording Gauges
Schaeffer & Budenberg, Brooklyn, N.Y.
Recording Thermometers
Schaeffer & Budenberg, Brooklyn, N.Y
Refiners
Bertrams Ltd., Edinburgh, Scotland.
Jensen og Dahl, J. & A., 1 Broadway, New York City.
Boving & Co., of Canada, Limited, Toronto, Ont
Chambers Ltd., 152 Bay Street, Toronto.
Marx, J. & Co., London, E.C., England.
Process Engineers, Ltd., Montreal, Canada.
Rice, Barton & Falls Mach. & Iron Co., Worcester, Mass.
Voith, J. M., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford, Can.
Rope Blocks
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Rosin Size
Fox, Stockell & Co., London, Eng.
Paper Makers Chemical Co., Easton, Pa.
Process Engineers, Ltd., Montreal, Canada.
Vera Chemical Co., North Milwaukee, Wis.
Wilson-Paterson Co., Board of Trade Bldg., Montreal, Can.
Rosin Size Boilers and Dissolvers
Boving & Co., of Canada, Limited, Toronto, Ont
Process Engineers, Ltd. Montreal, Can.
Rotary Silver Screens
Jensen og Dahl, J. & A., 1 Broadway, New York City.
Rotary Sulphur Furnaces
Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Pulp Mill Machinery Co., Montreal, Can.
Stebbins Engineering and Manufacturing Co., Watertown, N Y
Runways—Hand operated
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Save-Alls
Boving & Co., of Canada, Limited, Toronto, Ont.
Sherbrooke Mach. Co., Ltd., Sherbrooke, Que.
Waterous Engine Works Co., Ltd., Brantford, Can.
Self Landing, Self Delivery Hoists
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Screen Plates
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Screens
Bertrams Ltd., Edinburgh, Scotland.
Bezner, Albert, 299 Broadway, New York City
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street. Toronto.
Glens Falls Mach. Wks., Glens Falls, N Y
Harmon Machine Co., Watertown, N.Y.
Jenckes Machine Co., Sherbrooke, Que.
Johnson, Chas., St. Henry, Que.
Marx & Co., J., London, England.
Process Engineers, Ltd., Montreal, Canada.
Sherbrooke Mach. Co. Ltd Sherbrooke. Que
Tippet Arthur P. & Co., Montreal, Can.
Voith, J. M., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford, Can.
Westbye, P. P., Peterboro, Can.
Shear Legs
Morris, Herbert, Hoist & Crane Co., Toronto, Ont.
Slings
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Slitters and Re-Winders
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Cameron Machine Co., Brooklyn, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Moore & White Co., Philadelphia, Pa.
Ticonderoga Machine Works, Ticonderoga, N.Y.
Smelting Furnaces
Boving & Co., of Canada, Limited, Toronto, Ont.
Straw Cutters'
Bertrams Ltd., Edinburgh, Scotland
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Straw Dusters
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Straw Digesters
Boving & Co., of Canada, Limited, Toronto, Ont.
Strawboard Making Machines
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Chambers Ltd., 152 Bay Street, Toronto.
Steam Regulator
Pickles, W. F., Buckland, Conn.
Stuff Chests
Boving & Co., of Canada, Limited, Toronto, Ont.
Suction Couch
Process Engineers Ltd., Montreal, Can.
Sulphite Mill Equipment
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Process Engineers Ltd., Montreal, Can.
Stebbins Engineeringand Manufacturing Co., Watertown, N.Y
Sulphate Mill Equipment
Boving & Co., of Canada, Limited. Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Process Engineers Ltd., Montreal, Can.
Sulphur
Union Sulphur Co., 17 Battery Place, New York, N.Y.
Sulphur Burners
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co., Carthage, N.Y.
Glens Falls Machine Works, Glens Falls, N.Y.
Stebbins Engineering and Manufacturing Co. Watertown, N.
Tachometers (Hand and Stationary)
Boving & Co., of Canada, Limited, Toronto, Ont.
Schaeffer & Budenberg, Brooklyn, N.Y.
Track Systems
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Tanks
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Boving & Co., of Canada, Limited, Toronto, Ont.
Hamilton, Wm, Co., Peterboro, Can.
Jenckes Machine Co., Sherbrooke, Que.
McDougall, John, Caledonian Iron Works, Montreal, Can
Thermometers
Schaeffer & Budenberg, Brooklyn, N.Y.
Transmission Machinery
Caldwell, H. W. & Son Co., Chicago, Ill.
Canadian Allis-Chalmers. Limited Toronto.
Boving & Co., of Canada, Limited, Toronto
Jones & Glassco, Montreal, Can.
Traveling Cranes
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.
Trolleys
Morris, Herbert, Crane & Hoist Co., Toronto, Ont.

MILL SUPPLIES---Continued

Turbines
Boving & Co., of Canada, Toronto, Ont.
Canadian Allis-Chalmers, Ltd.. Toronto, Ont.
Smith, S. Morgan Co., York, Pa.
Voith, J. M. Co., Inc. New York, N.Y.
Voith, J. M., Wurtemberg, Germany.

Water Strainers
Jensen og Dahl, J. & A., 1 Broadway, New York City

Water Wheels
Boving & Co., of Canada, Limited, Toronto, Ont.
Canadian Allis-Chalmers, Ltd., Toronto, Ont.
Hamilton, Wm. Co., Ltd., Peterboro, Can.
Smith, S. Morgan Co., York, Pa.
Voith, J. M., New York, N.Y.

Wire Cloth for Paper Machines
Chambers, Ltd., Toronto.
Christie, Geo., Ltd., Glasgow, Scotland,
Johnson, C. H. & Sons, Ltd., St. Henry, Montreal, Que
Kufferath. Andreas, Mariaweiler, Germany.
Tippet, Arthur P. & Co., Montreal, Can.
Taylor, J. A., Montreal, Can
United Wire Works, Ltd., Edinburgh, Scotland.
Westbye, P. P., Peterboro, Can.

Waste
Hough, R., London, England.

Wet Machines
Bertrams Ltd., Edinburgh, Scotland.
Boving & Co., of Canada, Limited, Toronto, Ont.
Carthage Machine Co.. Carthage, N.Y.
Chambers Ltd., 152 Bay Street, Toronto.
Glens Falls Machine Works, Glens Falls, N.Y.
Hamilton, Wm. Co., Peterboro, Can.
Norwood Engineering Co. of Canada, Ltd., Cowansville. P.Q.
Process Engineers, Ltd., Montreal, Canada.
Sherbrooke Machinery Co., Sherbrooke, Can.
Voith, J. M., New York, N.Y.
Waterous Engine Works Co. Ltd., Brantford Ont.

Wood Preparing Machinery
Bezner, Albert, 299 Broadway, New York City

PULP AND PAPER MILL PRODUCTS

This aims to be a complete list of the products of Canadian Pulp and Paper Mills, who are urged to send us lists of brands and watermarks, as well as the headings under which they wish to be indexed. Buyers who cannot meet their requirements from this list, are invited to communicate with the editor, who is in close touch with the mills, and will gladly furnish full information.

PULP MILLS

Ground Wood Pulp

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
Basin Electric Light & Power Co., Ltd., Montmagny, Que.
Beaver Co. Ltd., Thorold, Ont.
Belgo-Canadian Pulp & Paper Co., Shawinigan Falls, Que.
Brompton Pulp & Paper Co., Brompton and E. Angus, Que.
Booth, J. R. Ottawa, Ont.
Bronson Co., Ltd., Ottawa, Ont.
Clyde River Pulp & Paper Co., Ltd., Liverpool, N.S.
Colonial Wood Products Co., Ltd., Thorold, Ont.
Campbell Lumber Co., Weymouth, N.S.
Canada Paper Co., Ltd., Montreal, Que.
Chicoutimi Pulp Co., Chicoutimi, Que.
Compagnie de Pulpe de Dalmas, Dalmas, Que.
Davy, James, Thorold, Ont.
Eddy Co., The E. B., Ltd., Hull, Que.
East Canada Power & Pulp Co., Ltd., Nairn Falls, Que.
Foley-Rieger Pulp & Paper Co., Ltd., Thorold, Ont.
Ford, J. & Co., Port Neuf, Que.
Jacques-Cartier Pulp & Paper Co., Montreal.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
La Cie de Metabetchouan, St. Andre, Que.
La Havre Pulp Co., Ltd., Bridgewater, N.S.
Lake Megantic Pulp Co., Lake Megantic, Que.
Laurentide Co., Ltd., Grand Mere, Que.
MacLaren Co., Ltd., The James, Buckingham, Que.
McLeod Pulp Co., Ltd., Liverpool, N.S.
News Pulp & Paper Co., Ltd., St. Raymond, Que.
Nicolet Falls Pulp & Lumber Co., Nicolet Falls, Que.
North Shore Power, Railway & Navigation Co., Clarke City.
Northumberland Paper & Electric Co.. Campbellford, Ont.
Nova Scotia Wood & Pulp Co., Ltd.. Mill Village, N.S.
Ontario Paper Company, Thorold, Ont.
Ouiatchouan Falls Paper Co., Ouiatchouan Falls, Que.
Powell River Co., Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que'
Price-Porritt Pulp & Paper Co., Rimouski, Que.
Reed, A. E. & Co., (Nfld.), Ltd., Bishop's Falls, Nfld.
River-du-Loup Pulp Co., Ltd., Fraserville, Que.
Soucy, F. Florentine, Old Lake Road, Que.
Spanish River Pulp and Paper Mills, Ltd., Espanola, Ont., Sturgeon Falls, Ont., Toronto, Ont., and Sault Ste. Marie, Ont
St. George Pulp and Paper Co., St. George, N.B.
Thorold Pulp Co., Ltd., Thorold, Ont.
Trent River Paper Co., Ltd., Frankford, Ont.
Union Bag & Paper Co., Cape Madeleine, Que.
Trent Valley Paper Mills, Glenmiller, Ont.
Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Q

Kraft

Brompton Pulp & Paper Co., East Angus, Que.
Dryden Timber and Power Co., Dryden, Ont.
New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
Quebec and St. Maurice Industrial Co., La Tuque, Que.
Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que

Soda Fibre

Canada Paper Co., Ltd., Montreal and Toronto.
Dominion Paper Co., Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.

Sulphite Fibre

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
Booth, J. R., Ottawa, Ont.
Dominion Pulp Co., Ltd., Chatham, N.B.
Edward Partington Pulp & Paper Co., Ltd., St. John, N.B.
Eddy Co., The E. B., Ltd., Hull, Que.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Lake Superior Paper Co., Ltd., Sault Ste. Marie, Ont.
Powell River Co., Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que.
Riordan Pulp & Paper Co., Ltd., Montreal, Que.
Spanish River Pulp and Paper Mills Ltd., Sturgeon Falls, Ont., and Sault Ste. Marie, Ont.
Swanson Bay Forests, Wood, Pulp & Lumber Mills, Ltd., Swanson Bay, B.C.
Toronto Paper Mfg. Co., Ltd., Cornwall, Ont.

PAPER MILLS

Bag
Eddy, The E. B. Co., Ltd., Hull, P. Q.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
Ford, J. & Co., Port Neuf.
Wilson, Ltd., J. C., 61 St. Alexander Street, Montreal, Que.
Jonquiere Pulp Co., Jonquiere, Que.

Binders' Board

McArthur, Alex. & Co., Montreal.
Northumberland Paper and Electric Co., Campbellford, Ont.

Blotting
Canada Paper Co., Montreal, Que., "Velvet Blotting."

Board
See Wood Board and Cardboard Specials.

Bond
Canada Paper Co., Ltd., Montreal, Que. "Burmese Bond," "St. Lawrence Bond," "Canada Bond," "Burmese Linen Ledger," "Windsor Mills Special," "Silverstream," "Springvale," "Super Writing," "White Railway," "Railway Manilla."
Howard Smith Paper Mills. Ltd., Montreal & Beauharnois, Que.
Kinleith Paper Co., Ltd., St. Catharines, Ont.
Rolland Paper Co., St. Jerome, Que., Mount Rolland, Que. and Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Book and Litho

Canada Paper Co., Ltd., Montreal, Que. "Art Photo Book," "Tinted Art Book," "Art Chromo," "English Book," "Satin Book," "Satin Litho," "Litho Label," "Super S. C. Book," "Standard S. C. Book," "Windsor Book."
Eddy Co., The E. B. ,Ltd., Hull, Que.
Kinleith Paper Co., Ltd., St. Catharines, Ont.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Box Board

See Wood Board and Cardboard Special.

Dominion Timber Regulations

Licenses to cut timber on Dominion Lands in the Provinces of Manitoba, Saskatchewan, and Alberta, the Northwest Territories, within twenty miles on either side of the main line of the Canadian Pacific Railway in the Province of British Columbia, and in the tract of three and one-half million acres to be located by the Government of the Dominion in the Peace River district in the Province of British Columbia, lying east of the Rocky Mountains and adjoining the Province of Alberta, shall be disposed of by public auction at the office of the Dominion Timber Agent for the district in which the berths are situated.

Before any parcel of timber is offered for sale it shall be surveyed by a duly qualified Dominion Land Surveyor into berths of an area not exceeding twenty-five square miles, and each of such berths shall then be thoroughly cruised by a duly qualified timber cruiser in the employ of the Dominion Government. The Minister shall then fix an upset price at which the berth shall be disposed of, and no berth shall be sold at less than the price so fixed.

Purchases to the amount of one thousand dollars or under shall be paid in cash at the time of sale. Purchases over one thousand dollars and not exceeding five thousand dollars shall be paid, one-half in cash at the time of sale, and a note or notes shall be given for the remaining half of the purchase price, payable in three months, with interest at the rate of five per cent. per annum. Purchases over five thousand dollars and not exceeding ten thousand dollars shall be paid one-third in cash at the time of sale, and notes shall be given for the remaining two-thirds of the purchase price, payable in three and six months, with interest at the rate of five per cent. per annum. Purchases exceeding ten thousand dollars shall be paid one-fourth in cash at the time of sale, and notes shall be given for the remaining three-fourths of the purchase price, payable in three, six and nine months, with interest at the rate of five per cent. per annum. Notes shall be made payable at a bank in the city or town in which the sale is held or at a bank in the city of Ottawa. Cash payments must be made at the time of sale in legal tender or by an accepted cheque on a chartered bank, or by a draft issued by a chartered bank, payable to the order of the Deputy Minister of the Interior. If default is made in any payment required by this section the sale shall be forfeited and void.

The purchaser must also pay the cost or the estimated cost of the survey of the berth before a license is issued.

The licensee shall pay an annual ground rent of five dollars per square mile except for lands situated to the west of Yale, in the Province of British Columbia, in which case the yearly ground rent shall be five cents per acre.

The licensee shall pay the following dues on timber cut on his berth:—

Sawn lumber, 50 cents per thousand feet, board measure.

Railway ties, eight feet long, 1½ cents each.

Railway ties, nine feet long, 1¾ cents each.

Shingle bolts, 25 cents per cord.

And 5 per cent. on the sale of all other products of the berth.

Timber Permits

Yearly permits are granted to settlers, mine operators and others on application to the Dominion Timber Agents, from whom further information can be obtained.

W. W. Cory
Deputy Minister.

Department of the Interior, Ottawa,
December 20th, 1912.

PAPER MILLS---Continued

Bristol

Don Valley Paper Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.
Canada Paper Co., Montreal & Toronto, "King Bristol," "Windsor Bristol," "C. P. S.Tinted Bristol," "Canada Bristol."

Building and Sheathing

Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que.
British Columbia Sulphite Fibre Co., Ltd., Vancouver, B.C.
Eastern Paper Co., Ltd., St. Basile, Que.
Montreal Paper Co., St. Basil, Que.
Northumberland Paper and Electric Co., Ltd., Montreal.
Riordon Pulp and Paper Co., Ltd., Montreal, Que.
Western Paper Mills, Ltd., Vancouver, B.C.
Jonquiere Pulp Co. Ltd., Jonquiere, Que.
Ford, R. & Son, Port Neuf, Que.
Laurentide Co., Ltd., Grand Mere, Que.
McArthur, Alex. & Co., Montreal, Que.
McLeod Pulp Co., Ltd., Liverpool, N.S.
Walker, J. R. & Co., Montreal, Que.

Cardboard Specials

Hinde & Dauche Paper Co., Ltd., Toronto, Ont.
Jonquiere Pulp Co., Jonquiere, Que.
Macleod Pulp Co., Ltd., Liverpool, N.S.
Canada Paper Co., Windsor Mills, Que. "Victor Printers' Blanks," "Superior Translucent Bristol," " C.P.C. Coated Litho," "Superfine Litho Blanks."
Booth, J. R., Ottawa, Ont.
Eddy, E. B. Co., Ltd., Hull, Que.
Laurentide Co. Ltd., Canada Life Building, Montreal, Que.

Carpet Lining

Ford, J. & Co., Port Neuf Station, Que.
Montreal Paper Co., St. Basile, Que.
Northumberland Paper & Electric Co., Ltd., Campbellford, Ont.
Wentworth Paper Mills, West Flamboro, Ont.
Western Paper Mills, Ltd., Vancouver, B.C.

Coated

Ritchie & Ramsay, Toronto, Ont.
Georgetown Coating Mills, Ltd., Georgetown, Ont.
National Paper Co., Valleyfield, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.

Corrugated Paper

Lazier Paper Mills, Ltd., Belleville,
Hinde & Dauche Paper Co., Ltd., Toronto, Ont.

Cover

Canada Paper Co., Ltd., Montreal and Toronto, "Tinted Art Cover," "Derby Cover," "Fibrestoc Cover," "Cashmere Cover," ''X Cover," "XX Cover."
Eddy Co., The E. B. Ltd., Hull, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Ritchie & Ramsay, Toronto, Ont.

Envelope

Don Valley Paper Co., Ltd., Toronto.
Kinleith Paper Co., Ltd, St. Catherines, Ont.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Felts

Bird, F. W. & Sons, Hamilton, Ont., and Pont Rouge, Que.
Eastern Paper Co., Ltd., St. Basile, Que
McArthur, A. & Co., Montreal, Que.
Ford, J. & Co., Port Neuf, Que.
Ford, R. & Son, Port Neuf Station, Que.
Montreal Paper Co., St. Basile, Que.
Northumberland Paper & Electric Co., Ltd., Campbellford.
Western Paper Mills, Ltd., Vancouver, B.C.

Fibre

Canada Paper Co., Ltd., Montreal and Toronto.
Dominion Paper Co., Montreal, Que.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
McArthur, Alex. & Co., Montreal, Que.
Riordon Pulp and Paper Co., Merritton, Ont.
Strathcona Paper Co., Strathcona, Ont.
Wilson, Ltd., J. C., Montreal, Que.

Flour Sacks

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McArthur, Alex. & Co., Montreal, Que.
Moira Paper Mills, Belleville, Ont.
Riordon Pulp and Paper Co., Ltd., Montreal, Que.
Strathcona Paper Co., Strathcona, Ont.

Kraft

Brompton Pulp & Paper Co. Ltd., East Angus, Que.
Dominion Paper Co. Ltd., Montreal, Que.
Dryden Timber and Power Co. Ltd., Dryden, Ont.
New Brunswick Pulp & Paper Co., Ltd., Millerton, N.B.
Wayagamack Pulp & Paper Co., Ltd., Three Rivers, Que.

Leather Friction Board

Walker, J. R. & Co., Montreal, Que.

News

Anglo-Newfoundland Development Co., Ltd., Grand Falls, Newfoundland.
Belgo-Canadian Pulp and Paper Co., Shawinigan Falls, Que.
Booth, J. R., Ottawa, Ont.
Canada Paper Co., Ltd., Montreal and Toronto, "Canada Brand."
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Jonquiere Pulp Co., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Lake Superior Paper Co., Sault Ste. Marie, Ont.
Lincoln Paper Mills Co., Ltd., Merritton, Ont.
McArthur, Alex. & Co., Montreal, Que.
Miller Bros. Co., Ltd., Glenmiller, Oht.
News Pulp & Paper Co., Ltd., St. Raymond, Que.
Powell River Co. Ltd., Powell River, B.C.
Price Bros. & Co., Ltd., Kenogami, Que.
Riordon Pulp and Paper Co., Ltd., Montreal, Que.
Spanish River Pulp & Paper Mills, Ltd., Toronto, Ont
Ontario Paper Co., Thorold, Ont.

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Bird, F. W. & Son, Hamilton, Ont., and Pont Rouge, Que
Ford, Joseph & Co., Port Neuf, Que.
Ford, Rowland and Son, Port Neuf, Que.
Montreal Paper Co., St. Bazile, Que.
Walker, J. R. & Co., 35 Common, Montreal, Que.
Western Paper Mills, Ltd., Vancouver, B.C.

Straw Board

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Lazier Paper Mills, Ltd., Belleville.
Lincoln Paper Mills Co., Ltd., Merritton, Ont
McArthur, A. & Co., Montreal, Que.
Moira Paper Mills, Belleville, Ont.
Northumberland Paper & Electric Co., Campbellford, Ont
Trent River Paper Co., Ltd., Frankford, Ont.
Trent Valley Paper Mills, Glenmiller, Ont.

Tag

Don Valley Paper Co., Ltd., Toronto, Ont.
Eddy, The E. B. Co., Ltd., Hull, Que.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
J. R. Booth, Ottawa, Ont.

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Garden City Paper Mills, Ltd., St. Catharines, Ont.
Interlake Tissue Mills, Ltd., Merritton, Ont.
Wilson, J. C., Ltd., 61 St. Alexander Street, Montreal, Que

Wall Board

Beaver Co., Ltd., Beaverdale, Que.
Bishoprick Wallboard Co., Ottawa, Ont.

Wood Board

Beaver Co. Ltd., Thorold, Ont.
Booth, J. R. Ottawa.
Brompton Pulps Paper Co. Ltd., East Angus, Que.
Canada Paper Co., Montreal, Que.
Eddy Co., The E. B., Ltd., Hull, Que.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Northumberland Paper & Electric Co., Campbellford, Ont.
McLeod Pulp Co., Liverpool, N.S.
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Wilson, J. C., Ltd., 61 St. Alexander St., Montreal Que

Wrapping

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Dominion Paper Co., Montreal, Que.
Don Valley Paper Co., Ltd., Toronto, Ont.
Eddy Co., The E. B., Ltd., Hull, Que.
Ford, J. & Co., Port Neuf, Que.
Ford, Rowland, Port Neuf, Que.
Gore Valley Paper Mills, Dundas, Ont.
Jonquiere Pulp Co., Ltd., Jonquiere, Que.
Laurentide Co., Ltd., Grand Mere, Que.
Canada Paper Co., Monreal and Toronto.
See also Kraft.

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Howard Smith Paper Mills Ltd., Beauharnois, Que.
Kinleith Paper Co. St. Catherines, Ont.
Rolland Paper Co., Montreal, Que.
Provincial Paper Mills Co., Ltd., Toronto, Ont.
Toronto Paper Manufacturing Co., Cornwall, Ont

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Gage, W. J. Co., Ltd., 84 Spadina Ave.
Hodge-Sheriff Paper Co., McKinnon Building.
Howell, G. A. Co., 10 Wellington E.
Livingstone, H. E. & Co., 80 George.
McNairn, J. H., 5 Jarvis.
Thorne, A. M. & Co., 45 Colborne Street
Victoria Paper & Twine Co., Ltd., 415 King W.
Waters Bros., 33 Front E.
Whyte, Alex., 64 Wellington Street, W.
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Dickinson, John & Co., Ltd., 216 Lemoine.
Little, T. B. & Co., 23 Cote.
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Reid, C. DeWolf, Herald Bldg.
Robertson & Parker, St. Paul.
Rolland, J. B. & Son, 14 St. Vincent.
Smith, Howard, Paper Mills, Ltd., 138 McGill.

Quebec, Que.

Andrews, F. H. & Son, 64 St. Paul.
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Foreign

Salomon & Co., Felix, New York City,
Whitaker Paper Co., Cincinnati, Ohio.
Castle, Gotheil & Overton, New York, N.Y.
Churchill & Sim, Clements Lane, London, E.C., Eng.
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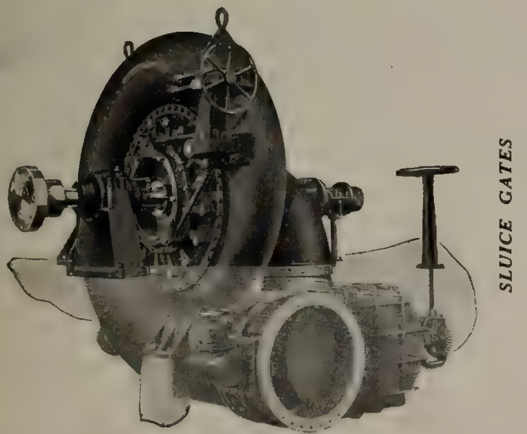

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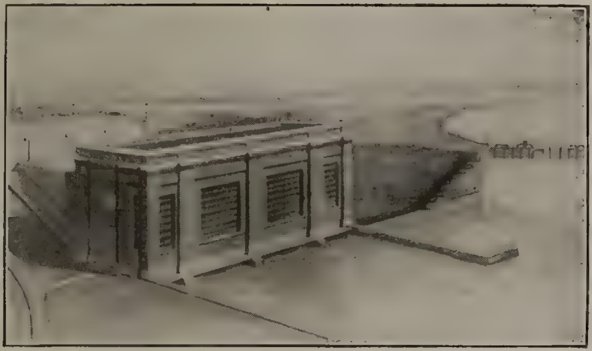

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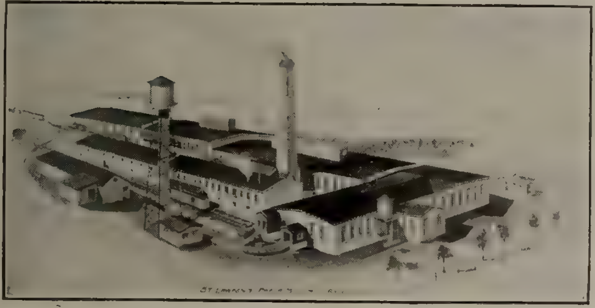

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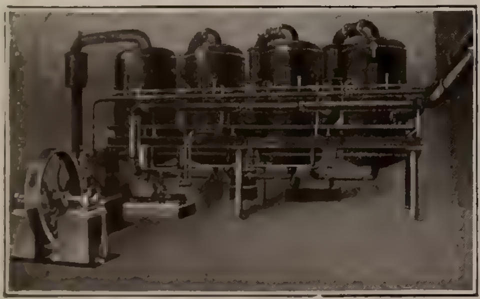

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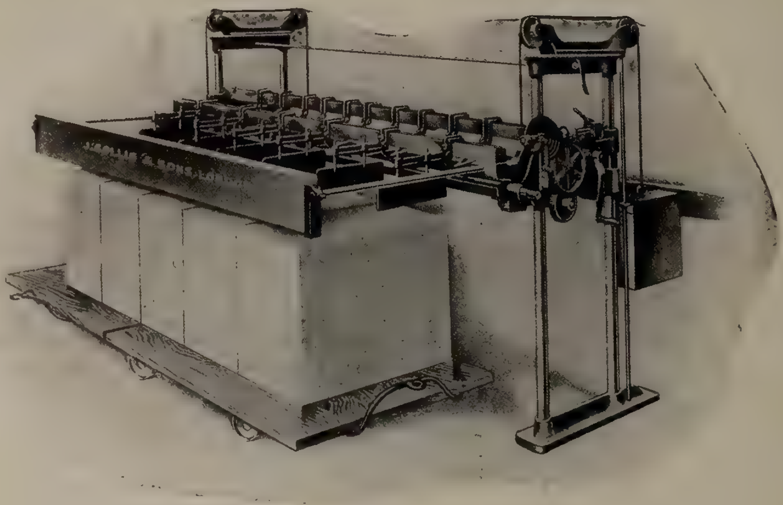

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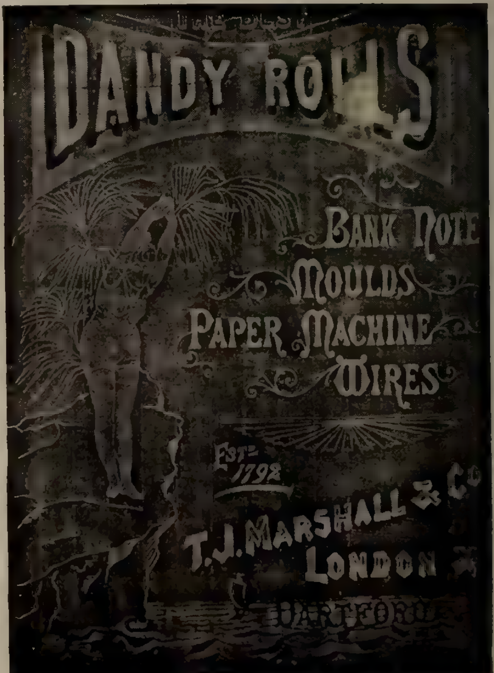

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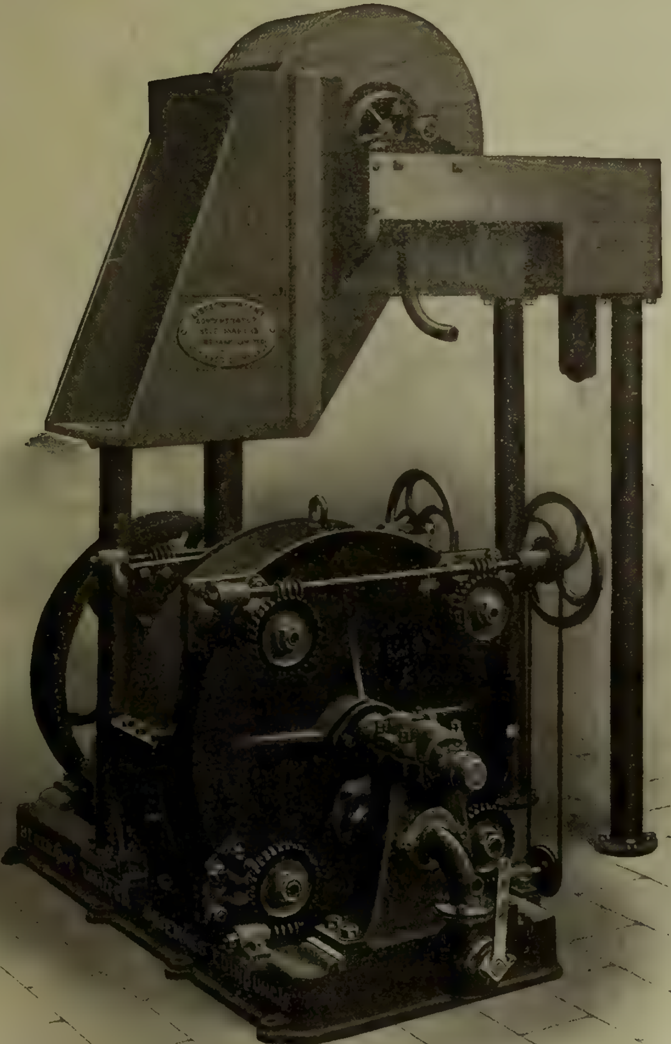

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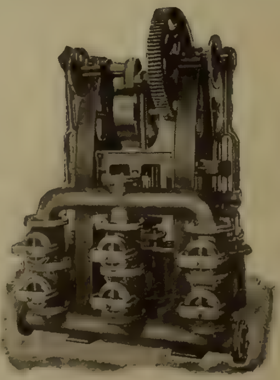

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